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STOVER'S MOLDING MACHINE.

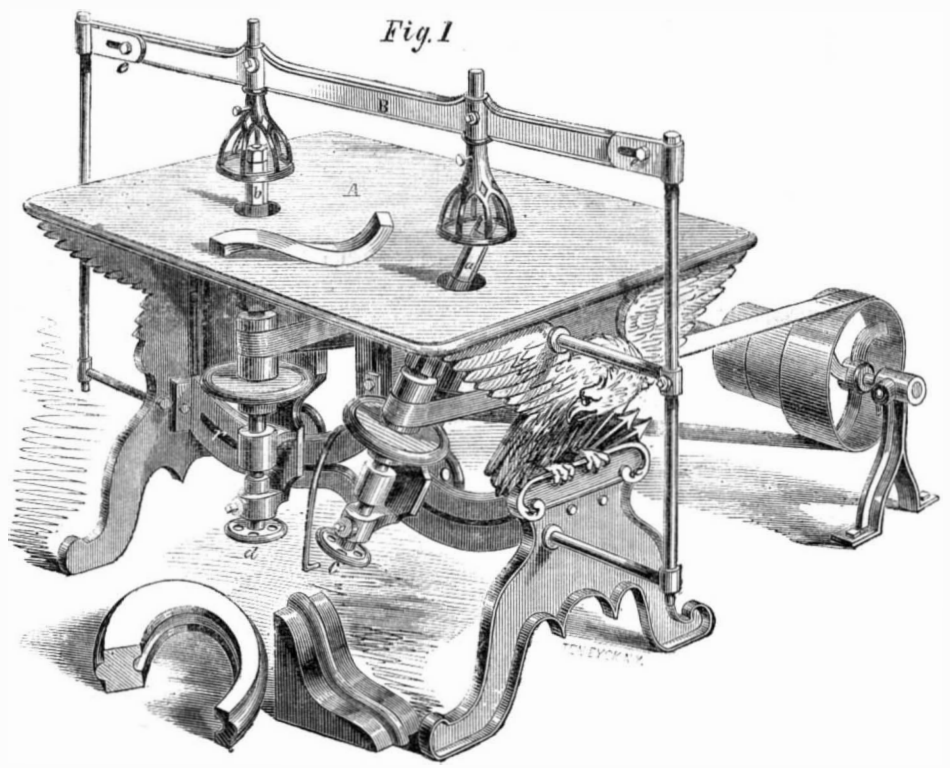
There is no machine which produces so great a variety of effects, by a few parts, as the molding machine; and the one which we here illustrate, by the simple device of inclining the cutter head at various angles, in addition to the almost endless variety of results usually produced, is able to cut surfaces of all conceivable forms, and is thus peculiarly adapted for fashioning ship-timber, furniture and molder's patterns, and for various other purposes. Stover's machine has also other peculiarities, which we will endeavor to make plain with the aid of the annexed engravings.

A plane table, A, is supported on a strong iron frame, and has passing through it the swiftly-revolving shafts, *c* and *d*, which carry the cutter heads, *a* and *b*, upon their upper ends. As these shafts and cutter heads are similar, a description of one will suffice for both: The cutter head, *b*, then, has firmly secured, at two opposite sides, two steel cutters with the edges parallel to the length of the head, and projecting a very little from the surface, in the manner of a plane-iron. Between the cutters and the table is a smooth surrace for a pattern to press against; the pattern being previously fashioned in the form desired, the "stuff" to be cut is fastened upon it and pressed against the revolving cutters, which, of course, rapidly plane away the stuff, and give it the same form as the pattern, as it is carried along with the pattern in contact with the guide. The shaft, *d*, is supported on a step at the bottom, and runs in two journal boxes, the top one of which is hung on pivots, and the bottom one is fastened by a set screw in any part of the curved slot, *r*, so that the shaft may be inclined at any desired angle, as shown by the shaft, *c*. For protecting the hands of the operator from being wounded by the revolving cutters, the cast-iron basket-work shields are brought over the cutters. These are fastened by set screws to the bar, B, which is supported by rods also held by set screws, so that the hight of the shields may be adjusted at pleasure. The bar, B, is fastened at its ends to the two pieces which support it on the rods, by means of screws in elongated holes, so that it may be turned up to remove the shields out of the way in changing the cutters; or the whole apparatus may be removed by drawing the rods from their supporters. When the inner edges of oval picture frames are to be carved, or other work done in which these shields would be in the way, the shield represented in Fig. 2 is substituted. The shield, C, is screwed upon the cutter head at any desired hight from the table corresponding with the thickness of the stuff, and is held in place by a nut which is secured tightly upon it; the collar, *k*, serving to hold the shield in its position concentric with the shaft.

The guide for the pattern is attached to the upper journal box, and the revolving shaft passes through it looscly, so that the guide does not revolve, and the usual wear to the pattern from this cause is prevented. As the belt which drives the shaft constantly draws it against one side of the journal boxes, and thus wears one side of the box more than the other, the shaft is thus removed from its position concentric with the guide: to obviate this, the journal box is bushed with a crescent-shaped lining of metal, the thick portion of which is placed at the side of the greatest wear, and which may be forced out against the shaft by set screws as it is worn away.

Fig. 3 represents the form of that portion of the cutter head to which the cutters are secured, with the curved groove or recess for the shavings. A cutter for moldings is represented at S, in Fig. 2; the shield being let partly over it by a slot, and the wing of the shield acting to regulate the depth of the cut before the pattern is

Fig. 1



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carried in against the guide. Figs. 1, 2, 3, 4, 5, 6 and 7 (next page) illustrate the method of fastening the cutter irons in the head. When long irons are used, they are made double, in the manner of the double iron for the bench plane, in order to make smooth work in cross-grained hard wood; and they are fastened to the head in the mode shown in Figs. 6 and 7. Two straight-beveled grooves are made in the collars at the top and bottom; and the double iron, *f*, being placed in the grooves, a curved steel clamping piece, *g g*, of spring temper, is pressed very firmly a ainst them by turning the nut, *h*, and forcing down the collar, *i*, the bevel in the groove drawing in the ends of the steel clamp, and its curved form causing it to press with great force against the middle of the iron. Fig. 7 shows the position of the pieces before the nut is screwed home, and Fig. 6 afterwards.

The cutter irons are made a very little shorter than the clamps, in order that they may be inclined a trifle edgewise to bring their edges parallel with the cutter head, in case the edges should not be ground exactly at right angles with the end. This mode of fastening the cutters permits them to be made of iron, a matter of great importance in cutters for molding, which must be made with edges of various shapes for fashioning all the numerous styles and sizes of moldings required. As these cutters have to be filed into shape, the use of iron as the principal material in their composition facilitates very much the labor of making them. Of course, it is necessary to face their edges with steel; and this is done in a mode to preserve the edge of steel as the cutters are worn away When a series of cutters are used, one pair above another, it is necessary to interpose collars between the pairs, and experience has shown that there is great liability in these collars to turn, and thus loosen all the cutters. To prevent this turning, Mr. Stover flattens the screw of the cutter head on two sides, and fashions the holes in the collars to fit this flattened screw, as shown in Figs. 4 and 5. This also brings the cutters nearer the center, and adapts them to cutting small circles.

When the stuff is first brought in contact with the cutters, before the pattern eaches the guide, it is liable to be caught by the cutters, and thrown from the table. To obviate this, a movable clamp (represented in Fig. 8) is provided, one end of which rests upon the table, and the other end, N, is provided with a toothed or serrated jaw, which may be pressed down upon the stuff to hold it firmly in place. For pressing it down, a bar, P, is pivoted to the middle of the clamp, and, passing through a slot in the table, is connected at its lower end with a lever, one end of which rests against the lower side of the table, and the other end is provided with a strap and stirrup for the foot of the operator. The slot extends nearly the whole length of the table, and is crossed by a wider slot at the end, through which the clamp may be dropped, when not in use, upon supporting bars below. The serrated jaw revolves upon a pivot, allowing the stuff to be turned upon this pivot as a center, and the edge or end cut in the arc of a true circle. As the clamp may be placed in any part of the slot, the radius of this circle may be varied at pleasure.

For carving certain warp surfaces for heavy ship-timber, an arrangement is made to feed the timber by a regular and positive motion of the machinery, and, at the same time, to vary the angle of the cutter head, also, by an automatic device. For this purpose, a long screw or worm, so geared to the machinery as to receive a slow revolution, is made to carry the lower journal box along its curved slot by a perfectly regular and very slow motion. As the feed of the timber may be varied at will, it will be seen that this combination enables the operator to cut the edge of a timber, one portion at any desired obtuse angle (within the compass of the curved slot) gradually bringing the edge up to a right angle,

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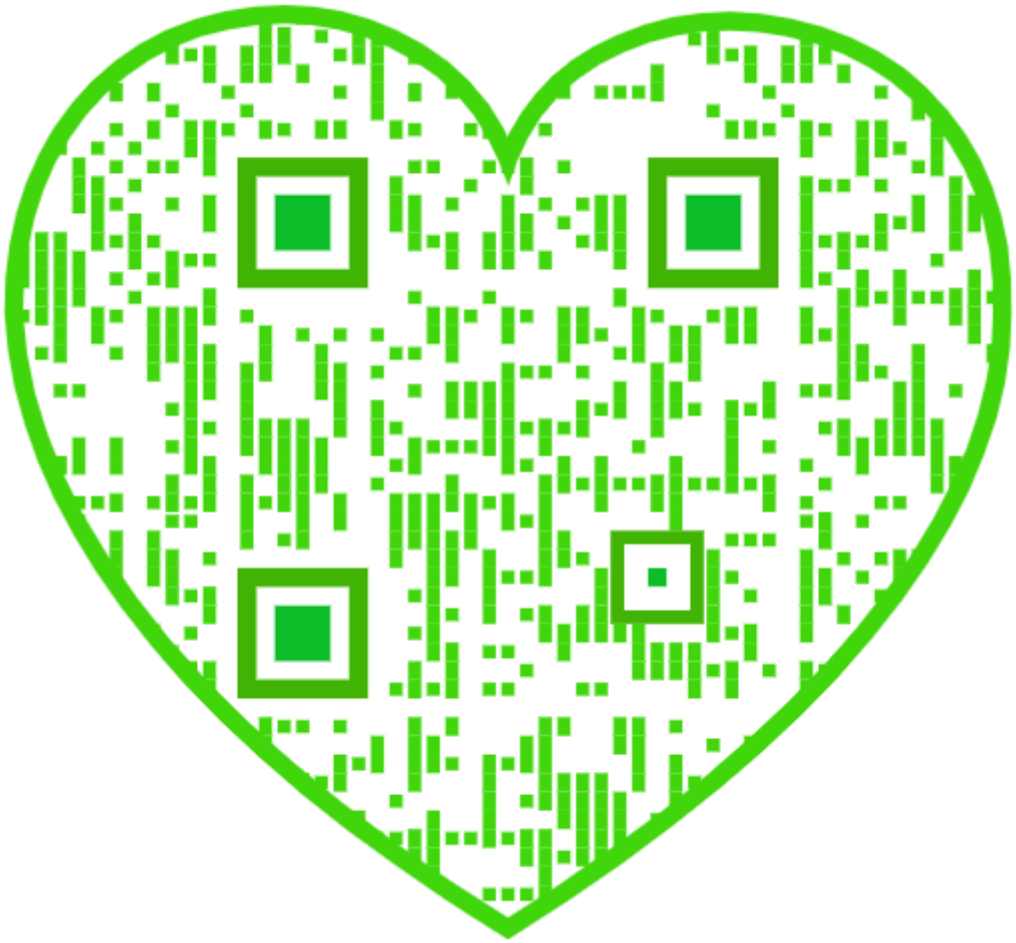
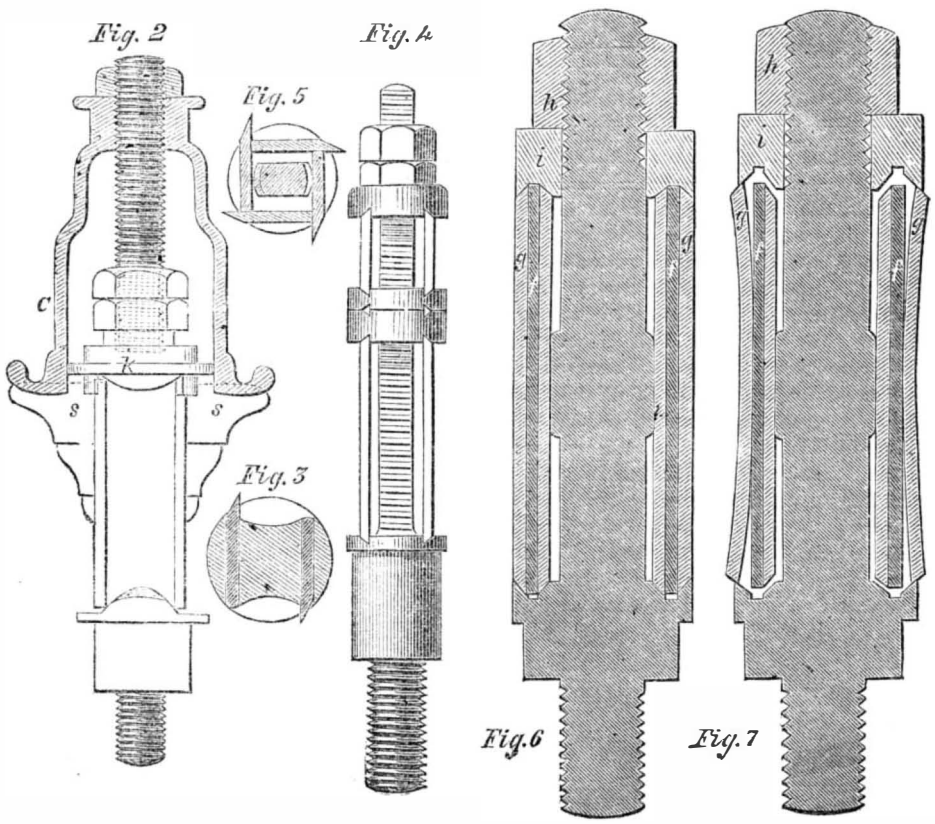


and carrying it down to quite an acute one; r the warp may be reversed from the one here described, commencing with an acute angle and terminating with an obtuse one. Various forms of warp surfaces may also be cut by carrying the stuff wholly or partly around the inclined cutter, leaving the latter stationary at any



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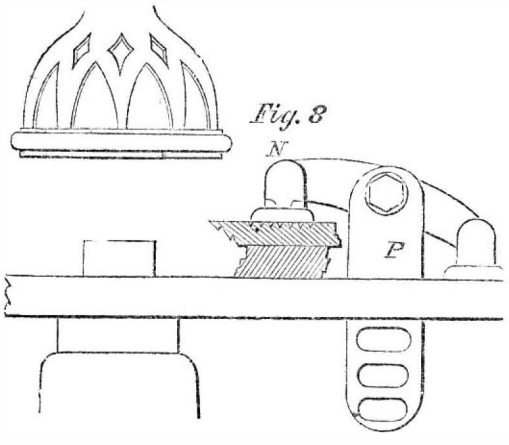
desired angle. This peculiar feature of this machine—the inclined cutter head—adapts it especially for cutting ship-timber, as well as for carving gun-carriages, fashioning heavy patterns of various forms for castings, and for shaping warp surfaces generally. We are told that the British government has some of these machines in use for carving gun-carriages at their large armories, and that orders have just been received for a number of them for the several navy yards in England. Machines may be seen in operation at the Manhattan Chair Company's manufactory, and at the Empire Works, in this city.

The four patents by which this invention is protected



are dated, severally, March 11, 1856; May 19, 1857; August 31, 1858; and August 30, 1859. Any further information in relation to the matter may be obtained by addressing the Stover Machine Company (H. D. Stover, President) 13 Platt-street, this city.

NEEDLE-MAKING

[From Once a Week.]

It is often asked, "Where do all the pins go to?" and it may be as pertinently inquired, "Where do all the needles come from?" The little machine that is put in action to make the greater part of the clothes of the world, and to minister to the vanity of the womenfolk, surely must have some birth-place worth noting, and a pilgrimage into Worcestershire the other day led us to its discovery. We are but too apt to associate with iron and steel workers, grimy and soot-clogged towns, blasted neighboring country, and pale and stunted artisans. The manufacture of needles, however, entails no such disagreeables. Redditch, the grand armory of the female weapon, is as pretty a little village as need be met with and were it not for the presence of a tall red chimney, and the hiss of a grindstone as you pass a water-wheel now and then, you may well imagine yourself in a Kentish village. Incited by curiosity, we asked permission to see the workshops of one of the largest manufacturers, which was most courteously granted, and an attendant ushered us into a little door, where a stalwart Vulcan presided over a fierce furnace, the walls of his apartment being hung round with coils of wire of all weights and sizes.

"Here," said our cicerone, "the needle makes its first start into existence;" and as he spoke the workman reached down a huge coil of wire, measured about three inches, and snapped off with a pair of shears, at one jerk, 60 small wires, each one forming, of course, the segment of a large circle or coil. To straighten this raw material of the future needles is his next care, and this he does in a very ingenious manner. The bundles of wires, as they are cut off, are put within two iron rings of about four inches diameter, and placed sufficiently apart to allow the whole length of the wire to rest between them; when the two rings are nearly full, the whole is placed in the furnace, and heated to a dull red heat. And now the future needle receives its first instruction. The workman, with an iron rod, rapidly works the wires within the two rings, one upon another, and this process of mutual attrition rapidly straightens them out, just as little boys, warped and bent from the the mother's knee, get set up true again by the bullying and hard knocks of a public school. The straighted wires are now handed over to the grinder to give them their points. We must take a little excursion out of the town to witness this process, inasmuch as this is performed by water-power. As we walked across the meadows, knee-deep in grass, and listened to the drip, drip of the merry mill-wheel, and saw the stream meandering in silver at our feet, it was difficult to believe that we were seeking a factory rather than the haunts of speckled trout. Still more difficult was it to believe that the little cottage, whose tallest rose peeped in at the casement, was nothing more than a workshop full of busy artisans; and more difficult than all to persuade ourselves that, in this apparent dwelling-place of health, a manufacture was being carried on which, not long since, was the most deadly in existence. We have all heard of the forkgrinders of Sheffield, whose average term of life is 29 years. Well, the occupation of a needle-grinder, a few years since, was no less deadly. The grinding process was carried on with a dry stone, and of old, the artisan, as he leaned over his work, received into his lungs the jagged particles of steel and the stone dust given off in the process, and, as a consequence, they speedily became disorganized, and his early death ensued. The expedient of covering over their grindstones, and driving out the dust by means of a revolving fan, was adopted only a few years ago. So little are men inclined to move out of the old accustomed ways, even to save their lives—nay, their lives have to be saved, even against their will—as even now, if not closely watched, they would disconnect the fans, and thus deliberately renew the old danger. Indeed, some of them look upon the danger as so much capital with which they think that the masters have no right to interfere, exclaiming, with the Shffield fork-grinders, that the trade is "so overfull already," that these fans will "prevent them getting a *living*." However, the higher intelligence of the masters, we trust, will prevent any relapse into former ways; and the deadly nature of needle-grinding is now only a thing of the past. The workmen we saw were certainly rosy, robust-looking men.

To return to our needle wires, however: it will be observed that the workman grinds *both* ends to a sharp point, for a reason which the next process makes evident. They are now taken back to the factory, and enter the stamping-shop, where girls, with inconceivable rapidity, place each wire beneath a die, and stamp exactly in the middle thereof two eyes and two channels, or "gutters," as they are termed. It is clear that the wire is to produce Siamese-twin needles, for another batch of little girls are now seen actively punching out the eyes that were before only indicated by the stamping process. The eyes stamped, another batch of urchins catch them up and "spit" them; in other words, pass fine wires between the two rows of eyes, a manœuvre preparatory to separating the Siamese into separate needles. The burr is now filed off, and the rough form of the needle is complete. Having been "licked" into form, its temper has next to be hardened. Fire again is called on to do its part; and the needles, in trays full, are once more heated to a dull red, and then suddenly quenched in oil.

This process makes them so brittle that they fly at the slightest attempt to bend them. Like fiery little boys, they want "taking down a little," which is done by placing them on a hot plate, and turning them about with two little tools shaped like small hatchets. This is very nice work indeed; and the change that is going on in the needle mass is marked by the change of color, the deep blue gradually growing pale, and a straw color, by faint shades, taking its place. At a particular moment the true temper is established, and then the heat is withdrawn. Having been thus tried by fire, earth (or stone) and water, some of the needles have perhaps got a little out of the straight line; and this is rectified by women, who take them up one by one, and, with wonderful delicacy of finger, discover its faulty parts, and with one tap of a hammer on a small anvil, restore it to its right shape. The education of the needle, in all its essentials, may now be said to be complete. It is fully formed, tempered and trained, and is about to leave school to receive that further polish which is to make it serviceable in the world.

And just as, in the world, the awkward youth is subjected to severe antagonistic influences, which, together, mold him into the smooth and pleasant man, so the needle, in like manner, suffers a wholesome trituration. The process is droll enough. Fourteen pounds' weight of needles, amounting to many thousands, are placed side by side in a hempen cloth, to which are added a certain modicum of soft soap and sweet oil. So far, this promises to be an "oily gammon" sort of process; but the addition of a due amount of emery powder soon dissipates any such anticipation. The mass is then wrapped up in a kind of "roly-poly" pudding; and when several puddings have been prepared, they are all slipped into a machine exactly like a mangle, the roly-poleys serving as the rollers thereof, and now the whole machine is set in motion by the water-wheel. Backwards and forwards, to and fro, grind and sweat the roly-poleys, with their layers of needle jam, for eight hours of eight mortal days, at the end of which time they are released from

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their terrible mauling, evidently all the brighter, smoother and pleasanter for the infliction. The oil of battle still clings to them, however; and, in order to get rid of it, the needles are thoroughly washed in soap-suds in a copper pan swinging upon a pivot, and then dried in sawdust.

They are now all at sixes and sevens, and have to be "evened," or placed in a parallel direction. This is accomplished by placing them in little trays. Heads and points still lie together; and in order to put them all in the same direction, the "ragger" is employed. The girl who performs this office places a rag or dolly upon the forefinger of her right hand, and, with the left, presses the needles against it; the points stick into the soft cotton, and are thus easily withdrawn and laid in the right direction. Little children "rag" with inconceivable rapidity, and with equal speed the process of sorting, according to lengths, is performed; the human hand appreciating even the sixteenth of an inch in length, and separating the different sizes with a kind of instinct with which the reasoning power seems to have nothing to do. The needles are now separated into parcels, and such is their uniformity that, like sovereigns, weighing takes the place of counting—1,000 needles in one scale exactly balancing 1,000 in another. The needles, being now placed in companies, are in future manœuvred together; that is, the heads of each company are simultaneously subjected to heat in order to soften them, for the double purpose of giving a blue to the gutters (which is considered an ornament), and of counter-sinking the eyes, in order that they may not cut the cotton. The final processes of grinding the heads and points, and polishing, is now performed by skilled workmen. The needles, in companies of 70 each, are subjected to a small grindstone, the workmen slowly revolving the whole number, so that they are ground in a mass, as it were, and the polishing being accomplished in a like manner on a similar wheel smeared with crocus. The original batch of wire, of 14 lbs. weight, gives material for 48,100 needles; and, after having undergone every process, it is found that they number, on the average, 46,700; so that the loss by breakage has only been 1,400. Even with this comparatively small waste, however, the accumulation of imperfect needles in course of time is immense. We saw heaps of many tuns weight in the premises of one of the large manufacturers. It is roughly calculated that upwards of 10 tuns of wire are weekly employed in the manufacture of needles in Redditch and the adjoining villages. If we multiply this by 52, we get the enormous weight of 520 tuns of needles turned out annually from this neighborhood alone. This mass, representing a number of needles which we feel unequal to calculate, goes to keep company, we suppose, with the pins, the mysterious manner of whose final disappearance has never yet been properly accounted for.

A. W.

CURRYING LEATHER.—Although currying is very nearly connected with tanning, being merely a continuation of the operations necessary to prepare the leather for use, it is very generally exercised as a separate branch of business. It applies chiefly to the stronger kinds of leather, such as ox-hides, technically called *butts*, or *backs;* cow-hides, which are lighter, and to which the term *hides* is appropriated by the tanner; and *skins*, the term apart for leather made of the skins of calves, seals, dogs, and similar animals. By the currier, the tanned skins are softened by soaking in water. The wet skin is then thrown upon a beam with the flesh side outermost, and the leather is reduced to a uniform thickness by means of a double-edged knife of a peculiar construction, which is applied horizontally. It is afterwards thrown into water to be scoured and extended; and for this purpose it is laid on a stone table and worked well with the edge of a small square stone fixed in a handle, and cleared with a brush from a whitish substance which appears in all leather tanned with bark. The hide being then removed to the drying shed, there is applied to it a mixture of oil and tallow, and it is dried either under the shed or by a stove. The next operation is called boarding or bruising. The skin is doubled and worked with a coarse grooved board till it is well softened, and is again lightly shaved, which leaves the flesh side clean, and after the second boarding it is said to be "finished russet." The blacking is usually performed by the currier.—*Book of Trades.*

IMPORTANT HINTS ON VENTILATION

BY E. M. RICHARDS, C.E.

[Written expressly for the Scientific American.]

[Continued from page 378.]

The correct method of proceeding with regard to the ventilation of an ordinary dwelling-house is as follows:—When building, have an opening made in the middle of the ceiling of each room; from these openings let conduits or pipes be laid alongside the joists, in the space between the ceiling of the lower room and the floor of the room above. These pipes are to lead into a main shaft constructed in the chimney like an ordinary flue, except that it does not open into the atmosphere at the top, but is conducted down to some fire-place that will be constantly in use—the kitchen one for instance. It would be very easy to so construct the cooking range that the mouth of this shaft could discharge directly under the grate bars, and to cause the fire to draw its supply of air through it, and consequently suck the foul gases of all kinds out of the various chambers with which this conduit connects. This continual withdrawal of the noxious air from the apartments is more necessary where coal gas is the lighting material. There is generally more or less escape of this unburnt; and it adds much to the unwholesomeness of rooms. Flat ceilings are not so well adapted to the purposes of ventilation as those that are concave; sunken panels are especially to be avoided, as they offer mechanical obstructions to the free escape of the polluted current, and may cause it to descend to the lower parts of the rooms, instead of freely entering the "upcast" pipe. If a cooking-stove be used instead of a range, a slight modification will be necessary; the main shaft must then discharge, with an upward draft, into (perhaps) the same flue that the stove does, which flue, being warmed by the passage of the smoke, &c., will help to draw the air from the various rooms connected with it; so that, in either case, the poisonous products of respiration, animal effluvia, unburnt gas, &c., are removed, as fast as formed, by a constant upward current, in accordance with their natural ascending power.

The method of heating by means of hot air gives a circulation to the atmosphere of the rooms, but it is not a healthy system—the air supplied to the lungs is too hot and dry. Our climate is already too stimulating, and it is much to be feared that the general introduction of "heaters" will add to the prevalence of that fatal disease, consumption. For ordinary dwelling-houses, well regulated stoves or open fire-places, in conjunction with correct ventilation, are far preferable. For large public buildings, heated pipes supplied by steam or hot water are probably better; but, at all events, save us from hot *air!*

It is more necessary to construct some special apparatus for the removal of foul air than to provide for the entrance of pure, for the latter will generally find its way in if the former be promptly got rid of; and at any rate, a slight opening of the lower window-sash will supply the requisite amount; though of course, to complete the affair as it should be done, there ought to be at least one ample fresh air inlet for each room, independent of the windows. If the chamber be warmed by an open fire-place there ought to be an "incast" on each side of the grate, a little distance from it, situated in the wall, about 1½ feet from the floor. The mouths of these incasts should be covered with fine gauze to spread the in-coming draft and prevent an unpleasant stream pouring upon any one. If admitted (as is sometime recommended) by multitudes of small holes through the floor, it both raises dust and gives cold feet as it ascends; if, on the other hand, the points of entrance are situated at a greater elevation than the mouth of a seated or recumbent individual (as is generally the case in railroad cars, whenever any attempt at all is made at ventilation), the entering fresh air, in its descent, encounters the escaping foul air rising towards the upcast; the latter, being cooled by the contact, loses its force of ascent, and becomes partially mixed with the pure element, which, in this deteriorated condition, is breathed by the inmates of the room. This would of course be a great evil, and would defeat, to a codsiderable extent, the purpose for which ventilation was intended; so the correct rule is, to make the fresh current enter the chamber at some point between the floor and the mouth of a person lying on a sofa or bed. If the incasts are made in the wall opposite the fire-place, they will cause a draft of cold air (in winter) to come upon the backs of those sitting round it. These remarks refer only to that kind of ventilation in which the air is admitted at the temperature of the external atmosphere; it would, of course, be perfectly possible to warm it to any desired degree before introducing it, but this is more requisite for large public halls than private houses, where only a limited number of persons supply the rooms. The incasts and upcasts should all be furnished with valves to regulate their size according to the state of the weather, or to throw them out of connection with the conduits altogether when desired.

Care should be taken to draw the supply of fresh air from as pure a locality as possible. It would probably be better to have only one or two external apertures to the incast main pipe, and to have service branches proceeding from it to the different rooms, as in the case of the foul air vents. The incast should be protected at its entrance into the air, so that no vermin could get into it; and the various parts of the apparatus ought to be made as approachable as possible, to facilitate repairs when needed. In case it is impossible to adopt the plan here detailed, the atmosphere of a room may be very much improved by removing a brick out of the chimney, close to the ceiling (in the case of an open fire-place being used), so as to form a communication with the flue; and a tin or sheet-iron damper may be fixed to close it when desirable. If a stove be the means for warming the apartment, it is advisable to have the stove-pipe made considerably too small to fill the aperture in the chimney, because this leaves a space around the former. The heat will cause an in-draft from the room to the flue, and if, at the same time, the window be kept more or less open, a small family of *non-smokers* can inhabit the chamber without injury. Paper should never be pasted over the stove-pipe hole in summer. In the case of large public buildings, a furnace is often kept going, to exhaust the air from the various halls, &c., or a number of gas-burners are used for the same purpose. The latter plan has some advantages, as they can be applied at the top of the building and save the return shaft necessary in the other case. The admission of the pure air is managed on the general plan indicated, but it might be slightly warmed (but not *heated*) for winter and cooled by passing over ice in summer. In this larger application of the principles of ventilation, each particular case must be treated according to the circumstances attending it. The ventilation of private houses is more important, inasmuch as we pass more of our time in them, at night especially, and in them, mainly, are the constitutions of our children formed.

If some such method as that which I have sketched was in general use, it would be an untold advantage to the nation at large; sedentary pursuits would be deprived of three-fourths of their injurious tendency. If persons, whose vocations forbid their passing much of their time out of doors, could only be furnished with an abundant supply of good breathing material while at their business, they would suffer comparatively little from the want of exercise; for, by a well regulated system of gymnastics, after business hours were over, they could keep their limbs and digestive organs in fair order.

The size of the foul and pure apertures must depend on the number of persons who are to inhabit the room, the number of lights burned and the velocity of the currents. The amount of air rendered unfit for respiration by a full grown man per minute, is variously stated at from 2 to 10 cubic feet. Let us suppose 7 cubic feet to be the correct quantity: now, if there is an apartment 20 feet long by 15 feet wide and 10 feet high, containing 3,000 cubic feet, and inhabited by 8 persons, those persons will render the whole air unfit for breathing in about 54 minutes, so that the 3,000 cubic feet of air must pass out of the foul vent every 54 minutes; to do this, with a velocity of about 365 feet per minute, an opening of about 5 inches square will be required. It must be remembered that the incasts should have a larger area than the upcasts, as the former have to supply oxygen to the fire as well as to the lungs of the inmates. The above calculation is only intended to show the amount required by the lungs. Where air-tight stoves are used, as in the northern States, the necessity for ventilation becomes more imperative; but the large open fire-places of the South somewhat mitigate the evils to which I have referred.

[To be continued.]

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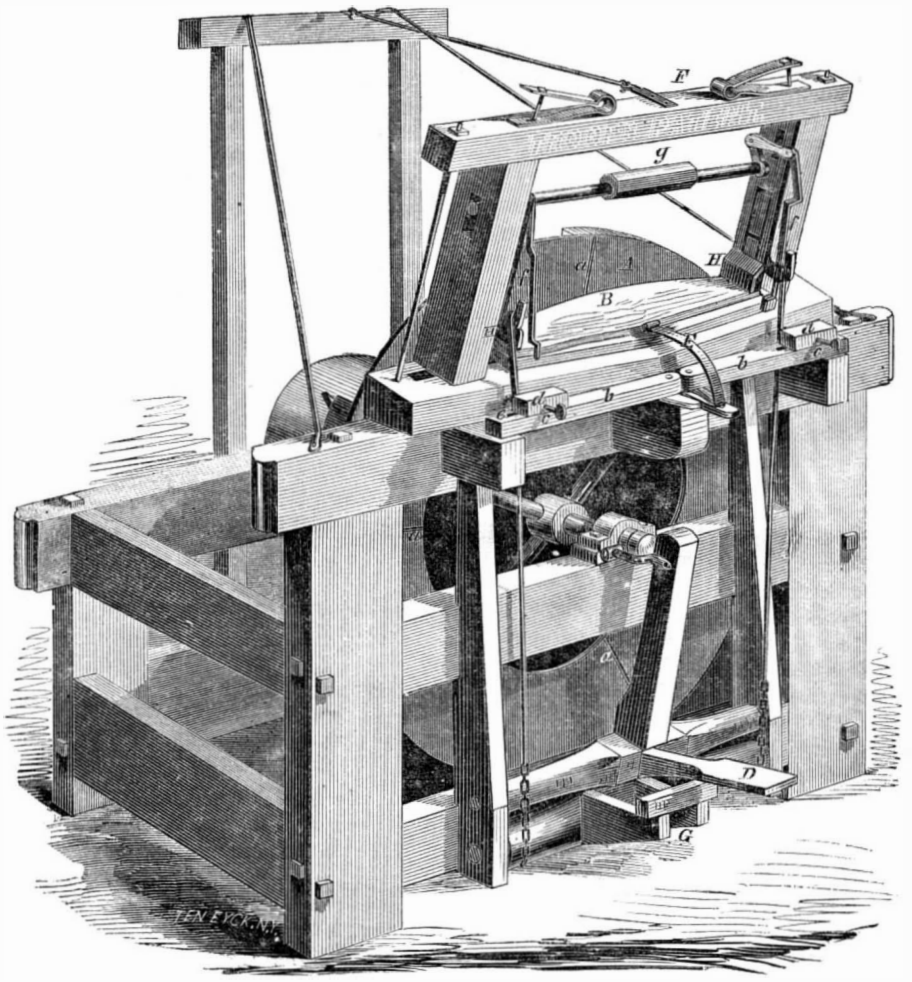
IMPROVED MACHINE FOR JOINTING STAVES.

President Pierce said, in one of his public addresses, that an English manufacturer who had been examining the industrial operations of this country remarked to him that, in the various forms of working in wood, the Americans employed a greater variety of machinery, and far less manual labor than any other people. How numerous and how important have been the improvements in this department of machinery within the few years that have passed since the Englishman made his observation! It is difficult to believe that an equal length of time in the future will witness as many and as great improvements in this line, but all past experience forces us to the conclusion that such will be the case. The many mechanical devices combined in original modes in the machine for jointing the edges of staves, which we here illustrate, is an indication of the working which is going on in hundreds of minds in our broad domain, and which will unquestionably bring forth its fruit.

A is a revolving wheel with cutters, *a a*, projecting slightly from its side in the manner of plane-irons. The stave, B, is placed upon the machine in such manner that its edge is presented to the cutters and the wheel A, which, with its shaft, has a horizontal sliding motion, is brought, by depressing the treadle, D, to the edge of the stave, which is planed away. To give the edge of the stave the requisite curved form, the frame upon which it is laid has a vibratory motion about a vertical axis which corresponds with the middle of the stave. The wider the stave, the more curving, of course, does its edge require to be, and this curvature is adjusted to the width of the stave by a simple contrivance which will be readily understood. The screws, *c c*, are screwed through the blocks, *d d*, and their ends limit the extent of the vibrations of the frame. The blocks, *d d*, are fastened upon two levers, *b b*, which work upon fulcra at their ends, *e*. The opposite ends of these levers are connected by links with a slide, C, which may be pushed into the frame and drawn out by the hand. Upon the slide, C, is fastened the spring, E, and the slide is pushed into the frame such distance as to bring the curved end of the spring against the near edge of the stave, thus moving the levers, *b b*, and the screws, *c c*, to points varying with the width of the stave.



TROOP'S IMRROVED STAVE JOINTER.

The rods, *f f*, are connected with the shaft, *g*, in such a manner as to be swung to and fro, by turning the shaft, and to preserve always positions parallel to each other. This is done to facilitate the placing of the stave upon its bed, it being necessary merely to swing the rods, *f f*, against the ends of the stave to place the latter parallel with the machine. The stave is held firmly in place by the clamps, H H, which are brought down upon it by depressing the treadle, G. When the stave is placed, the operator, with one foot upon the treadle, D, brings the wheel against the edge of the stave, and by turning with his hands the frame, F, about its axis, he planes the edge of the stave exactly in the proper curve. The proper bevel is given to the edge of the stave by inclining the frame, F, at an angle as shown.

The patent for this machine was issued to Jonathan Troop, of Sinclairville, N. Y., April 5, 1859 (through our agency); and any further information in relation to the matter may be had by addressing the inventor as above, or S. A. Heath & Co., 37 Park-row, this city.

SCREW FASTENINGS FOR SHIPS.

The naval constructor—J. W. Griffiths—of the new war steamer *Pawnee* has published a full description of this vessel in the Washington *Union*. It seems that several nautical authorities have attempted to criticise unfavorably her mode of construction. We quote his remarks in regard to her fastenings. He says:—"There are persons who have objected to screw fastenings, but some of the largest mail steamers have their engines fastened down to their keelsons with wood screws. There is no other fastening which will hold railroad cars, stages and light vehicles, for road service. They have been proved to be better than rivets for all such service, in securing iron on wood. Why is this? Simply this: whether the wood is below the water and swells, or above water and shrinks, the threads are held with increased tenacity. This is not the case with rivets; if the wood shrinks, the ring or burr of the rivet becomes loose, and many such may be found on board of every ship in the navy. If the jar of a railrord will not cause the screws to work out, surely they will not come out of a ship, where there is no such tremulous motion experienced. It is but too well known that copper bolts, however hard they may be driven, lose their original drift very soon. It is to obviate this defect in copper fastenings that copper as well as iron screws were introduced in the *Pawnee*. No man whose judgment is of any value in mechanism will dare assert that copper or iron screws are a better or safer fastening than bolts driven by hand, and depending for adhesion on the fiber of the wood."

CONTRACTION OF HORSES' FEET—CAUSE AND REMEDY.

The tendency of a horse's feet, in a healthy condition, is to expand whenever the weight of the body is thrown upon them. Being a very complicated piece of mechanism, they are very easily disarranged, and once out of order are difficult of repair; hence the necessity of preserving them in a sound condition.

Contraction is caused—1st, by cutting away the bars of the feet, which are the mainstays for the support of the quarters; 2d, by (opening the heels, as the smith calls it) cutting away a portion of the frog, in consequence of which the moisture of the frog becomes absorbed, losing its elasticity, and destroying its function, thus exposing the feet to injury by concussion; 3d, by standing upon plank floors; 4th, by improper shoeing.

An ordinary observer will, upon an examination of the common shoe, notice that it inclines from without inwards at the heels, thus forming a concavity for the feet to rest in; the consequence is a lateral resistance to the expansion of the hoofs, when the weight of the animal is thrown upon them. The effect of this resistance is to force the heels together, creating pressure upon the sensitive parts within the horny case; establishing fever, by which the moisture of the hoofs is rapidly absorbed, rendering the hoofs hard, brittle, and liable to crack, and frequently causing corns, navicular joint lameness, bony deposits to be thrown out from the lateral wings or processes of the coffin bones, rendering the animal permanently lame or unsound. These are but a few of the bad effects arising from contraction; enough, however, to serve our purpose at present.

Remedy.—Preserve a level bearing by making the shoe perfectly flat on the quarters, so as not to interfere with the expansion of the feet. Should contraction already exist to a considerable extent, bevel the shoe slightly outward at the heels, in order to facilitate expansion. Care should be taken not to bevel too much, or bulging of the lower part of the hoofs at the quarters will be the result. The shoe should in all cases be forged and not twisted, as is sometimes done to save trouble by the bungling smith. Proper applications, to soften the horny parts and promote elasticity, should also be used. Such preparations are put up in the form of hoof ointments. —*R. Jennings, V. S.*

ART OF ETCHING.

Etching is the superaddition of the chemical process of corrosion to drawing when performed on a plate of copper, over which a substance called etching-ground is laid. This etching-ground is a substance composed of wax, asphaltum, gum mastic, resin, &c., incorporated by melting over a fire, and capable of resisting the action of aquafortis. It is applied by the aid of heat, so as to lie in a thin stratum on the copper. To transfer the design to the copper, an outline is made with a black lead pencil on a piece of paper, and laid with the face downwards on the etching-ground; the whole is then passed through a rolling-press, the effect of which is to transfer an impression of the outline on to the prepared ground. After this the design is completed with the etching needles, which removes the ground from the copper wherever they pass, and expose it to the action of the acid during the process of biting in. The aquafortis continues on the plate until the fainter parts are supposed to be corroded sufficiently deep; after which it is poured off, the plate washed with water, and left to dry. The parts which are bitten in enough are then covered with what is called stopping-ground, which is a mixture of lampblack and turpentine; this is applied with a camel-hair pencil, and allowed to dry. After this the acid is again poured on, and this process of stopping-out and biting-in is repeated till the darkest parts are sufficiently corroded. Steel plates are etched as well as those of copper, and it sometimes happens that engravers are troubled to remove the oxyd formed by washing with cold water. The use of warm water instead of cold (not too hot to soften the asphaltum ground) washes out the salts of iron, and allows a clean face for the acid to bite deeper.

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SINGULAR METHODS OF HEARING.

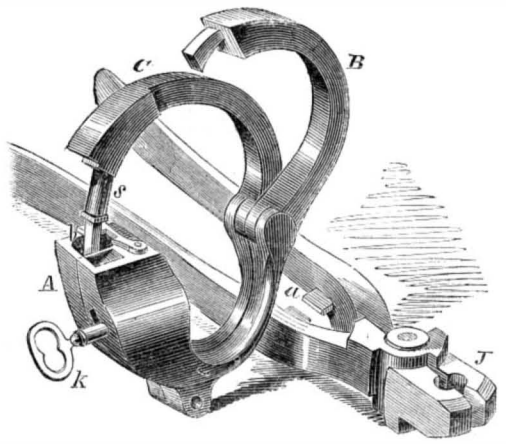
By universal consent the physical faculties of man have been divided into five senses—hearing, seeing, touching, tasting, and smelling. We become instinctively familiar with the various instruments with which in a normal state we are endowed to affect the various senses; with the eye we see—it is a telescope, microscope, and other philosophical instruments united. With the tongue we taste; with the ears we hear; with the olfactory nerve we smell; and with the nervous membrane diffused over the whole body, we feel by touch. Nevertheless these various instruments are all marvelously connected with one another, so that one will, in some peculiar way, play the part of the other, or without the one the other is useless; and this arises principally from the fact that we do not in reality obtain our knowledge of outward effects by the various organs we employ to ascertain them, but by the brain. Therefore, if the brain can be effected in a proper manner in any other way than through the eye, we shall yet be able to see; or again, if we can effect the brain with sound in any other way than through the ear, we can still hear. Some persons who are quite blind with the eyes do so improve or apply the faculty of touch that they become very familiar with outward objects as much so as some whose eyes are "wide open." If the nostrils are closed so as to destroy the sense of smelling, then we have no taste, rhubarb senna have then no more flavor than water. If when the eyes are closed we press them at the side, so as to remove the eyeball out of its natural position, we distinctly see, even in a dark room, a ring of light. Having any doubt about the taste of anything, our judgment is decided by the mere smell, and thus the brain is affected aright—but not always through the instrument or organ specially constructed for the purpose; and we are now about to show those who are deaf with the ears, that they may still participate in the sound through the teeth and throat. Hearing is properly effected by the vibration of what is called the tympanum, a nervous fiber stretched out like a drum head. It often happens that the tubes leading to the drum head are diseased. In such instances people are deaf simply from the fact that the sound cannot vibrate the drum membrane in consequence of the tubes being closed, yet the hearing instrument is quite perfect. Now there is a small passage extending from the ear-drum into the throat; it is called the eustachian tube, or guttural conduit. Its principal use is to carry away the natural secretion from the lining of the ear cavity, but, under certain circumstances, this tube conveys sound to the drum. Hence among a crowd of listeners eager to catch the voice of a speaker, many will be observed to sit with "open mouth," or as Sir Walter Scott says, "With locks thrown back and lips apart in listening mood." There was living recently (near Bury) a young man, the lobes of whose ears were closed; but when spoken to, he opened his mouth, and was then able to hear. Many persons, being deaf from similar causes, may be made to hear by placing the edge of the crown of a hat into the mouth, and holding the hollow part towards a preacher, or singer. Indeed, eustachian trumpets for persons partially deaf ought to be constructed, one end to be held in the mouth, and the other towards the sound desired to be heard. In many cases the eustachian tube will not convey direct sounds. If it did, we should hear ourselves speak as loudly with the ears closed as open, which is not the case. It appears to be more useful to those partially deaf than to those whose hearing is perfect. We can, however, also hear by means of the teeth. Bone is very sonorous, and is an excellent conductor of sound. There is at the Polytechnic Institution a musical instrument resembling a harmonicon, composed of bones, the music of which, extending over four octaves, is very melodious. Nearly all sounds that are harsh and unharmonious set the teeth on edge, indicative of sonorious vibration. Actual experiment proves that the teeth will convey sound to the auditory nerve as the following illustration shows:—Lay a watch upon the table glass side downwards, then stand so far from it that you cannot in the ordinary way here it ticking. Now place one end of a small stick, say about six feet long, upon the back of the watch, and grip the teeth to the other; with the fingers close each ear to exclude all external noise, the beat of the watch will then be as audible as if placed against the ear. All other sounds can be conveyed in the same manner, no matter how long the stick be; for instance, if one end be placed upon a pianoforte in a sitting-room fronting a garden, and the stick be 30 feet long, extending outside of the window on a lawn, if the instrument be ever so lightly played, the "tune" will be instantly distinguished by any person applying the teeth to the opposite end of the stick. Again, if a light bar of iron or other metal be suspended by a thick string held between the teeth, and then struck with any hard substance, the sound will appear greater than by hearing with the ears.

S. PIESSE.

LYON'S LOCK AND DETECTOR.

It is said that payment for freight stolen by employes is no inconsiderable item in the disbursements of our railroad companies, and that an effectual check to these depredations would be of great value. We illustrate a device for this purpose, which consists essentially of a lead seal attached to the lock in such a way that the lead must be severed to open the lock, and thus evidence of any fraudulent opening is preserved.

A represents a padlock provided with an ordinary shackle, B, which may be locked and unlocked by means of the key, *k*. The shackle, C, has a round projection at its end, somewhat similar to the square on the shackle, B, and on this projection a screw thread is cut. This is not shown in the engraving as it is hidden by the lead tube or seal, *s*. A curved bar, *b*, also having a screw thread cut at its end, slides to and fro in the lock, but is prevented from coming entirely out by a lip on its inner end and a corresponding projection made in the



lock. The lead tube or seal is used to join together this curved bar and projection and the end of the shackle, C. For this purpose the tube is cast of such size that it may slip freely upon the screws at the end of the bar, *b*, and of the shackle, C. Both shackles are passed through the staple, and before they are locked, the leaden tube, *s*, is slipped upon the screws and compressed closely into their threads by means of the tool, T; thus fastening together the curved bar, *b*, and the shackle, C, so that the lock cannot be removed without cutting in two parts the leaden tube, *s*. The tool, T, is provided with steel shears, *a*, for cutting the tube when it is desired to open the lock. Each depot-master is to be furnished with a swaging-tool and a supply of lead tubes or seals, one seal to be expended every time the lock is opened. If any dishonest employe picks this lock, the severed seal preserves an evidence of crime which cannot be obliterated.

The patent for this invention was granted, Sept. 13, 1859, to John H. Lyon, of this city, to whom inquiries for further information may be addressed, directed to the care of Spaulding's Express Co., 240 Broadway, New York.

WOOL.—The history of the growth of wool is very curious. Fifty years ago not a pound of fine wool was raised in the United States, in Great Britain, or in any other country except Spain. In the latter country, the flocks were owned exclusively by the nobility or by the crown. In 1794, a small flock was sent to the Elector of Saxony as a present from the King of Spain, whence the entire product of Saxony wool, now of such immense value. In 1809, during the second invasion of Spain by the French, some of the valuable crown flocks were sold to raise money. The American Consul at Lisbon, Mr. Jarvis, purchased fourteen hundred head, and sent them to this country. A portion of the pure unmixed Merino blood of these flocks is to be found in Vermont at this time. Such was the origin of the immense flocks of fine wooled sheep in the United States.

BONE MANURE.

In a communication to the Germantown (Pa.) *Telegraph*, J. S. Keller gives the following very useful information regarding the value of bones for fertilizing purposes:—

"No subject on the farm is less generally understood than the properties of manure as regards the different soils and crops. As to what kinds of manure is best adapted for any particular soil, to produce the best result at the least expense, is an important question, which some might answer by saying that all manures will answer on all soils, and so they will; but the question is not answered. That some fertilizers will be better suited for some soils and some particular crops, must be evident to all observing farmers.

"That guanos and super-phosphates will stimulate the poorest soils to bring a crop, we need no more proof; but I doubt whether they can be applied to any advantage to the farmer on land already in tolerably good condition; and at the prices they are offered, it is questionable to warrant the purchase of any: they are one-third too high in price to put on any land. If farmers relied more on their own resources for fertilizers, they could save many dollars that they are paying, while their animals are left to lose all their droppings where they produce nothing.

"As a permanent manure, bones are, I believe, acknowledged by all practical and scientific men to be the most lasting. I have tested the value of bones to my entire satisfaction. Raw bones ground, moistened with diluted sulphuric acid, and mixed with Peruvian guano, applied on wheat and rye, have given me excellent results. Mediterranean wheat, weighing 64 lbs. to the bushel, I can boast of last year's produce on bone-manured land. The same land now is well set in grass, better than it ever was before.

"Not every farmer can have his own bone-mill, but a number can purchase one on joint stock, attach it to a power, and grind all the bones they could procure, thus enabling them to manufacture one of the most permanent manures we know of, superior and at a less cost than they can purchase fertilizers.

"By a careful system of soiling, in connection with bone and leather manure, most of our farmers could make a sufficiency of superior manurial matters for all purposes, without paying from $50 to $60 per tun for guanos and phosphates."

SORGHO DYE.—A. Winter, of Austria, has discovered a carmine-coloring matter in most parts of the Chinese sorgho, especially in the expressed stems, and has obtained a patent in Austria, Baden and other States. The process is as follows: The sorgho is pressed in the usual manner, and the empty cane piled up under cover in regular heaps, several feet high, and the fermentation which immediately sets in is so directed by more or less access of air as to prevent it from becoming putrid. After two weeks the whole mass is of a reddish brown or red color, when the fermentation is interrupted by drying. When dry, the mass is ground sufficiently fine, for the extraction of the coloring matter. It is covered in the proper vessels with cold soft water, and allowed to stand for 12 hours; but little of the pigment dissolves during that time. It is then drained and afterwards treated with a weak caustic soda or potash ley until this no longer extracts anything. This solution is carefully neutralized with sulphuric acid, thus precipitating the coloring matter in red flakes, which after settling is washed with water, collected on filters, and dried. This color dissolves in alcohol, alkaline leys, dilute acids, &c., and is employed for the dying of silks and woolens with the common tin mordants. The colors produced from it are said to be unchanged by light or by washing with warm soap-suds.—*Druggist's Circular.*

OUR COMMERCE.—Goods to the value of $14,895,000 were entered at the port of New York, as imports during the past month. Of this amount $1,970,000 were withdrawn for re-shipment, making altogether the sum of $12,925,000. This exceeds the amount received during the same period of time last year by $2,659,000. Our exports during the same time amounted to the sum of $10, 523,000, of which $4,383,000 consisted of bullion and specie, leaving a balance against us of more than $2,000,000 in one month.

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FRANKLINITE—METALLIC ORE.

It frequently occurs that minerals and other things receive names which convey no idea of their nature, but rather excite curiosity from their peculiarity, and such is the case in reference to the above-named substance. As it is a very peculiar and valuable mineral, and as we have had frequent inquiries regarding its nature and uses, we present the following description from a deservedly popular work, the "New American Cyclopædia," published b. Appleton, this city:—

Franklinite is a mineral composed of peroxyd of iron, oxyd of zinc, and oxyd of manganese, in appearance much like the magnetic oxyd of iron. It is found in considerable quantities only in Sussex county, N. J., although it is also mentioned as accompanying ores of zinc in amorphous masses at the mines of Altenberg (Vieille Montagne), near Aix la Chapelle. The composition of the Franklinite of New Jersey is:—

Constituents.	Berthier.	Thompson.	Dickinson.	Albich.
Peroxyd of iron . ..	66.09	66.10	66.115	66.86
Oxyd of zinc.....	17.00	17.43	21.771	10.81
Oxyd of manganese.	16.90	14.96	11.987	18.17
Silica	.....	.....	0.127	.....

Its hardness is 5.5-6.5; specific gravity, 5-5.09. It occurs in large veins or beds at the mines of the New Jersey zinc company at Stirling hill and Mine hill in Sussex county, accompanied by the red oxyd of zinc, lying between the crystalline limestone and the gneiss rocks. At Stirling hill it constitutes the main substance of two beds of considerable magnitude, lying in immediate contact with each other, divided only by a parting seam, running S. W. and N. E. and dipping S. E. about 40° from the hill against which the beds seem to repose, toward and under the bed of the Walkill river. The upper of these beds, lying immediately under the crystalline limestone, is composed chiefly of the red oxyd of zinc with the Franklinite interspersed in granular masses, often assuming the appearance of imperfect crystals. It presents a thickness varying from 3 to 8 feet, and is traced with great uniformity of structure. At times almost perfect crystals of Franklinite are found, particularly where the bed comes in contact with the superincumbent limestone; these crystals are of the regular octahedral form with the edges replaced. The Franklinite constitutes about 45 per cent of the mineral contents, the rest being mainly red oxyd of iron. This bed is extensively worked by the New Jersey Zinc Company, who remove annually about 8,000 tuns of the ore to their works at Newark, where they manufacture from it the white oxyd of zinc used as paint; the residuum, after the oxyd of zinc it driven off, being Franklinite, is smelted into iron. The underlying bed appears on the surface or outcrop to be almost a pure massive Franklinite, amorphous in structure, although occasionally also exhibiting very large and nearly perfect crystals of the Franklinite; it contains no red oxyd of zinc, which fact is the distinctive feature between this and the overlying bed, which is generally known as the bed of red zinc. As the underlying bed of Franklinite descends it becomes less pure; the Franklinite being replaced by the crystaline limestone, with the Franklinite and willemite (anhydrous silicate of zinc) thickly interspersed in grains and imperfect crystals. It preserves this character in its entire depth as far as explored, nearly 200 feet below its outcrop; this bed is about 12 feet in thickness, but is not worked. Several hundred feet westerly of these main beds, and higher up on the hill, another bed of Franklinite, mixed with a little of the red oxyd and a good deal of the silicate of zinc, is found, running the entire length of the Sussex hill; on the S. W. point of this vein a considerable quantity of ore is mined by the Passaic Zinc Company, and by them manufactured into white oxyd of zinc at their works at Bergen, near Jersey City. The other locality where the Franklinite is found in large masses is on Mine hill, about 1½ miles N. E. from Stirling hill, following the course of the Walkill to the village of Franklin. Here there are also found two distinct beds lying in immediate juxtaposition; but their relative position as compared with that of the beds at Stirling hill, is reversed, the Franklinite being the easternmost and uppermost, and the zinc being the underlying and westernmost. The formation generally on Mine hill seems considerably disturbed, and much less regular than on Stirling hill. The Franklinite on Mine hill, which promises from surface indications to be a rich and regular body of ore, has, however, not proved so in the numerous openings and explorations made by the Franklinite Iron Company, who erected a large blast furnace here some four years since for the express purpose of working this ore. They found it so much disturbed, and immediately below the outcrop so much mixed with other and useless substances, chiefly an impure garnet (silicate of iron), as to make the ore unfit for any metallurgical purposes. The attempts to smelt it did not prove successful, and the works were abandoned. The underlying or westerly bed, on the other hand, is much purer, and is composed of massive Franklinite, interspersed throughout with more or less red oxyd of zinc in spangles or small lamellar masses. Its outcrop is plainly traceable along the entire crest of Mine hill for nearly half a mile in length, varying from 3 to 5 feet in thickness; it has been worked to some extent by the New Jersey Zinc Company. A late examination of this ore by Professors J. D. Dana and B. Silliman, Jr., shows it to be composed of 46 to 48 per cent of Franklinite, the rest being mainly red oxyd of zinc, yielding, exclusively of the zinc in the Franklinite, 26 per cent of the oxyd of zinc. As has been already stated, the New Jersey Zinc Company, after extracting the zinc in the shape of the white oxyd from the ores of Stirling and Mine hills, smelt the residuum, consisting almost wholly of Franklinite, into iron. Attempts had been made many years since by some of the iron works in the neighborhood to smelt the Franklinite ore which appeared in such large masses and so easy to be mined; but none of these early operations proved successful, owing, no doubt, to the great quantity of zinc in the ore, which, in the process of volatilization, absorbs a large amount of heat, and thereby tends to chill the furnace. Early in 1853 Mr. E. Post, of Stanhope, N. J., undertook to work the ore with anthracite in one of the blast furnaces at Stanhope, and succeeded in making some pig-iron of excellent quality; but these operations were soon discontinued. In the same year Mr. C. E. Detmold successfully and permanently established the manufacture of iron from the zinc and Franklinite ores at the works of the New Jersey Zinc Company (of which he was then president), by smelting the residuum, after the zinc had been driven off, for the purpose of making the white oxyd. This branch of industry promises to become one of much importance, as the iron produced from this residuum not only yields a bar iron of remarkable purity, fiber and strength, but is especially suited to the manufacture of steel. The furnace in which this iron is made is 18 feet high and 8½ feet diameter of bosh; it produces annually about 2,000 tuns, and works uninterruptedly with very great regularity. The pig-iron produced is almost identical in character, appearance and structure with the best lamellar iron made of the famous spathic ores of Siegen and Musen in Germany. Its fracture shows large and brilliant silver-white lamellar facets, sometimes beautifully crystallized, and so hard as to cut glass; these crystals are not attracted by the magnet.

As we have witnessed some of the operations of making oxyd of zinc and pig-iron from this mineral, at the works of the New Jersey Zinc Company, near Newark, we will add to the above a brief account of the processes.

The Franklinite ore, after being broken into small pieces by stampers, is placed in a number of small furnaces which have open hearths below to admit plenty of air, but the products of combustion are carried off, above, in pipes, to a large adjacent building, where there are a large number of porous bags connected with the smoke-pipes. As the zinc is volatile when raised to an elevated temperature, it escapes up the smoke-pipes, combining with its equivalent of oxygen, and forms protoxyd (ZnO) of zinc. A draft produced by a steam-engine draws the gases from the furnace through the porous bags, leaving the oxyd behind in them, in the form of a white down, almost resembling snow-flakes. The gases of zinc are of yellow color when highly heated at the top of the fires; but when the oxyd is cooled by its long circuit through the pipes into the receiving bags, it assumes a white appearance. The oxyd of zinc thus obtained is afterwards thoroughly mixed in mills with oil, and forms the beautiful paint now much used for inside house-work.

The iron oxyd which is left behind as residuum in the furnaces, is taken and smelted in a proper iron furnace, as described in the foregoing. It requires a strong blast to smelt iron ore; the temperature in the zinc furnaces is too low for this purpose.

INTERESTING POSTAL DECISION.

The following gallant letter from Hon. Joseph Holt, late Commissioner of Patents, and now Postmaster-general of the United States, covers a decision of a question as interesting as it is novel. A husband who had been separated from his wife, demanded that the village postmaster should deliver *her* letters to *him*, and threatened a suit of law if his demand was not complied with. The wife, on the other hand, forbade the delivery of her letters to her husband. In these circumstances, the postmaster appealed to Mr. Holt for instructions. That gentleman pronounces the claim advanced by the husband too preposterous to be seriously refuted—indeed, he says it is as abhorent to law as it is to the Christian civilization of the age. We give Mr. Holt's letter in full:—

POST OFFICE DEPARTMENT, Nov. 30, 1859.

SIR:—In yours of the 23d inst. you ask for instructions in regard to the delivery of letters to a wife who is separated from her husband, but is not divorced; and you state that the husband claims all the letters addressed to her, and will commence a prosecution if his claim is not allowed, while the wife forbids that he shall be permitted to receive them.

The precise question raised by this state of facts has never before been presented to this department, which affords gratifying proof that there is no prevailing disposition on the part of American husbands to enlist the support of the postal authorities, in endeavors to intercept and violate the correspondence of their wives. In taking this step he has, no doubt, proceeded upon the mistaken assumption that, because of her legal identity with himself for certain purposes, these letters are therefore his absolute property, and he has a right to control the postmaster in their delivery. When a husband becomes estranged from his wife and abandons her, or by his neglect or cruelties compels her to abandon him, it would be as revolting to humanity, as subversive of sound morals, to suffer him to cut off her communication with those relatives and friends to whom in her hour of trial she might be driven to look for sustenance, or for that consolation which she might need even more than food or raiment. It has long since been adjudged, both in England and Scotland, that even after letters have reached the possession of those to whom they were directed, their writer has still such a property in them as will enable him to maintain an injunction to prevent their publication. *A fortiori*, does this interest exist when the letters, like those under consideration, are *in transitu*? This principle seems to be declared in the Act of Congress, which requires that all non-delivered letters, containing valuables, shall, with their contents, be returned to the writers, whose proprietorship in them could scarcely thereafter be controverted. The department, both in the transportation and delivery of letters, acts as the agent of the writers, from whose "warrant of attorney," as found in the superscription upon them, neither the counsel nor the command of the husband, nor of anybody else—under such circumstances as are here presented—will justify a departure. What state of facts would authorize a revocation or modification of this warrant of attorney by the writers themselves, it is unnecessary to discuss, inasmuch as it is not pretended, in this instance, that any such revocation has been made. If only such letters can be delivered to the wife as the husband may formally sanction, it would equally follow that none could be safely carried in the mails, written by her, without a like assent first obtained—a doctrine too preposterous to be seriously refuted. The husband, in this case, seems to have supposed that he has the same property in the thoughts and sympathies of his wife—though no longer a member of his household—and of her friends, that he has in her goods and chattels. This view of marital power might well find a place in the code of the Grand Turk, and would possibly be submitted to in his harem, but is repugnant to the teachings of American jurisprudence. While, in legal contemplation, the wife's existence is to a degree merged in that of the husband, it is also true that her individuality is for many purposes conceeded and defined, and that she has rights secured to her not only independent of, but in defiance of the will of her liege lord. She is legally and morally responsible, apart from him, and has necessarily guaranteed to her that freedom of thought and the interchange of thought, sought in this instance to be denied her, but without which the imposition of such responsibility would be an arbitrary and remorseless despotism. Hence it may be safely held that the jealous and heartless espionage attempted to be exercised by this husband over the correspondence of his wife, from whom he is separated, is as abhorrent to law as it is to the Christian civilization of the age, which recognizes woman as the companion of man, but not his slave.

You are therefore instructed to deliver the letters in question to the lady to whom they are addressed.

J. HOLT, Postmaster-general.

THE GREAT METEOR OF NOV. 15, 1859.

The officers of the Smithsonian Institute have undertaken to investigate this brilliant phenomenon, and have issued an invitation to all observers to forward a full description of it as seen by them, stating particularly the time and the point of disappearance. There is no doubt that this body of learned men will prepare a memoir on the subject, of the most reliable, full, and satisfactory character, and it is safest to postpone any inferences until the appearance of that memoir. From all the statements collected to the present time, it seems probable that the meteor threw off masses of matter over New York, and finally exploded and came to the earth in the neighhood of Delaware Bay.

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LIBRARIES OF THE UNITED STATES.

We are indebted to the author, William J. Rhees, chief clerk of the Smithsonian Institution, for a copy of a large octavo volume of 687 pages, which is filled with an account of the libraries of the United States and British possessions in North America. We find a few things in it which will interest many of our readers. The following is the general summary of the public libraries in the United States:—

	No.	Vols.
Libraries with volumes reported....	1,297	4,220,686
Libraries with volumes estimated..	1,593	500,000
Libraries of common schools.....	18,000	2,000,000
Libraries of Sunday schools.....	30,000	6,000,000
Grand aggregate.....	50,890	12,720,686

As showing the character of the books most read, we make the following extract:—

"The librarian of the Providence Athenæum has paid particular attention to collecting information as to the number and character of books read. From his reports for 1855 and 1857, the following facts are taken as illustrations:—

	1855.	1857.
Shares used.....	552	546
Volumes delivered.....	17,846	19,289
Average number of volumes to a share,	32	35
Fiction.....	8,971	9,214
Biography and History.....	2,158	2,971
Voyages and Travels.....	1,481	1,865
Poetry and Belles-Lettres.....	1,733	1,774
Art, Science and Law.....	972	1,087
Religion and Philosophy.....	843	873
Periodical and Miscellaneous Literature	1,688	1,505

"From an estimate by the delivery of their works, the following is the order in which the authors here mentioned are ranked by our reading community or rather, we should say, by those who use the books in the Athenæum Library. First, Sir Walter Scott; next, Simms, Cooper and Dickens, with not ten volumes difference between them; Irving stands next; then Mrs. Stowe; after her, Prescott, the historian, Charlotte Bronte and Mrs. Henzt; then Bulwer, Longfellow, Willis, Kingsley, Thackeray, Abbott, Macaulay, James, Bayard Taylor, Curtis, Hawthorne and Bancroft, in the order in which we have placed them. As some consolation to those who stand last in this list, it is proper to state that Shakspeare, if enumerated, would have to take his stand after the last of them. This apparent anomaly is only to be accounted for by the supposition that this author is to be found on the shelves of almost every one.

"It should be remembered, in connection with the classes of books taken out, in which that of fiction so greatly preponderates, that many proprietors of shares possess very considerable private collections of books; and perhaps the larger number of the actual readers, although not owning large libraries, do possess more or less of the standard works. These are not often the buyers of works of fiction or ephemeral literature, and rely upon the library of the Athenæum for them. This sufficiently accounts for the limited demand from the Athenæum for standard works in history, biography, and other higher departments of literature.

"A very slight circumstance will serve to turn the current of taste of our reading public into a particular channel; and a newspaper discussion or a popular lecturer sensibly influences the demands for the books on our shelves. The publication of Dr. Kane's travels, and the discussion about the 'cold term,' gave a great impulse to the demand for Arctic adventures; and the course of lectures given by a celebrated astronomer, during the last winter, kept our shelves bare, for a time, of all astronomical works. The reading year commenced simultaneously with the publication of 'Dred,' by Mrs. Stowe; and for a month or two the demand for the works of that authoress was commensurate with that for the works of Scott; but before the close of the year it had dwindled below that of the lowest on our list; while, on the other hand, the demand for the works of Charlotte Bronte, owing to the publication of her life by Mrs. Gaskell, has increased in nearly the same ratio. Such writers as Scott and Cooper, Irving and Dickins, are the general favorites, and the call for them appears to be about as great at one time as another."

The work is published by Lippincott & Co., of Philadelphia, and is sold by H. Balliere, No. 290 Broadway, this city.

THE TRANSMISSION OF KNOWLEDGE.

On the evening of the 5th instant, the Rev. Dr. Bethune delivered an interesting lecture on the above subject in the hall of the Mechanics' Library, this city. He proceeded to show how we received historical knowledge by transmission from man to man. Allowing 80 years to be the average age of man, from the Creation, 5,860 years ago, it would have taken but eighty-four men to connect us with that event. But we are not led to depend on tradition alone, for we have the inspired records of the Bible. Dr. Bethune then briefly explained the origin of idolatry, which first existed in the Persian or Chaldee nation. The doctrine of this idolatry was that of emanation, first of the world, next of the gods, then of matter, and lastly of heroes. The different ideas in the heathen minds caused a division among them. One part went to India, proof of which we find in the Hindoo mythology. Another part traveled southward to the Nile, under the leadership of Ham. The philosophy of this colony was also that of emanation, but became materially changed in process of time. Thus they worshiped the crocodile as the god of the river Nile, and as Egypt was a very fertile country, they worshiped Agriculture under the sign of an ox, or some animal similar to an ox. Still later they deified Production, under forms the most revolting. From Egypt the light of civilization—if such it might be termed—extended to Greece, under Cecrops. Greece in turn established colonies in Egypt, and it was in Alexandria that the Scriptures were translated into Greek. In Alexandria several schools arose. Pythagoras studied there, whence he went to Crotona and founded a school, the doctrines of which were adopted by Plato, and it was the Platonic philosophy that first went to Rome. Throughout the ancient writings there is no philosophy so seductive as the Platonic. It was the origin of the modern Rationalism. About the second century of the Christian era, the Alexandrian school was founded, and from its corruptions nearly all the heresies of the Christian Church have arisen. As the seat of empire was changed to Byzantium, the modern Constantinople, philosophy went with it. This the lecturer deemed a complete refutation of the hypothesis of the French schools that man was originally a savage. God did not make man one remove from a monkey. He made him in his own image. When Adam came forth from the hand of God, he came, if the expression might be allowed, a highly civilized man. Barbarism is a late state of man; civilization is the original. It was while the shepherds of Judea were watching their flocks by night and looking up into the heavens, that astronomy began. They were not savages who marked out the zodiac and calculated eclipses. Yet Rousseau tells us that man was originally a savage. Rousseau was far more of a savage than the first man. Dr. Bethune did not believe in indigenous civilization. On the contrary, civilization is, like fruit, propagated by grafts. We have a civilization that was in the garden of Eden, or at least was taught at its gates by our first parents.

THE STOMACH AND THE MIND.—Much of our conduct depends, no doubt, upon the character of the food we eat. Perhaps, indeed, the nature of our meals governs the nature of our impulses more than we are inclined to admit, because none of us relish well the abandonment of our idea of free agency. Bonaparte used to attribute the loss of one of his battles to a poor dinner, which, at the time, disturbed his digestion: how many of our misjudgments—how many of our deliberate errors—how many of our unkindnesses, our cruelties, our acts of thoughtlessness and recklessness, may be actually owing to a cause of the same character? We eat something that deranges the condition of the system. Through the stomachic nerve that derangement immediately affects the brain. Moroseness succeeds amiability; and under its influence we do that which would shock our sensibility at any other moment. Or, perhaps, a gastric irregularity is the common result of an over-indulgence in wholesome food, or a moderate indulgence in unsuitable food. The liver is afflicted. In this affliction the brain profoundly sympathizes. The temper is soured; the understanding is narrowed; prejudices are strengthened; generous impulses are subdued; selfishness, originated by physical disturbances which perpetually distract the mind's attention, becomes a chronic mental disorder; the feeling of charity dies out; we live for ourselves alone; we have no care for others. And all this change of nature is the consequence of an injudicious diet.

A COLUMN OF INTERESTING VARIETIES.

Samuel F. Holbrook, of Boston, writes that he is very busy in raising the big ships which were sunk in the harbor of Sevastopol. Eleven ships-of-the-line and twenty-four smaller ships have been raised, and he assures his countrymen that it is hard work. He gives a sad account of the immorality of the people now inhabiting that city, and is anxious to get away from it. One year more will be required to accomplish the undertaking of the company.....The price of coal-oil has been reduced in this market 50 cents per gallon in the last five months. A good article is now sold for $1 per gallon.....One of the viaducts of the Glasgow and South Western Railway has one arch, in masonry, of 180 feet span.....D. K. Clark, of England, has found that, in locomotive boilers which, just after having been blown off, evaporated 8½ lbs. of water per pound of coal, the apparent evaporation was increased to 9½ lbs. of water by allowing the boiler to become dirty. In the latter condition there was more priming, and a considerable quantity of water must have been carried over bodily without having been converted into steam.....The nominal horse-power of a steam-engine is found by the English Admiralty rule, by multiplying the square of the cylinder's diameter, in inches, by the velocity of the piston, in feet, per minute, and dividing the product by 6,000.....There are, in all, 2,624 locomotives used on the railroads in France.....Governor Seward was presented, in Alexandria, Egypt, with three superb Arabian horses, which will be shipped to this country. Two of them will be presented to the New York State Agricultural Society..... All the dogs killed in Cleveland, Ohio, last season, were skinned and the skins sent to a glove manufactory in Litchfield, Medina county, where they were converted into kid and buckskins.. ...Persimmon beer and brandy is being manufactured in considerable quantities. Mr. Schleider, of Louisville, Ky., has made two barrels of brandy from the product of one tree..... Arrangements have been made at Prairie du Chien to launch the steam ice-boat on the closing of the river. No doubts are entertained by the proprietor as to the success of the enterprise. The boat is to make semi-weekly trips to St. Paul. The engine is of sufficient force to draw sixteen loaded cars. Grain dealers are stationed at all important points up river, and will have a hundred thousand bushels of wheat ready for shipment on the first arrival of the boat.....The falling of the wire suspension bridge over the Scioto river, at Portsmouth, Ohio, was caused by the quicksand in the bed of the river, which undermined and let down one of the piers. Two men, undertaking to cross upon it against the remonstrances of the crowd on the bank, were instantly killed in the crash. The bridge originally cost $40,000. .....A popular author says: "I have no propensity to envy any one, least of all the rich and the great; but if I were disposed to this weakness, the subject of my envy would be a healthy young man, in full possession of his strength and faculties, going forth in a morning to work for his wife and children, or bringing them home his wages at night."".....The momentum of a pound of steam moving with a given velocity is the same as that of a pound of water moving with the same velocity..... Glue, or gluten, which constitutes most of the mass of the skins of animals, is soluble in water; tannic acid is also soluble in water; but if solutions of these two substances are mixed together, they immediately combine chemically and produce a substance which is insoluble; this is the chemistry of tanning.....Among the scions of the house of Bonaparte is a son of old Lucien, the Prince de Canino. The young man is a priest of the Romish church, and being the personal *protege* and favorite relative of his imperial cousin at Paris, has seen himself raised from one clerical dignity to another, till at last, the influential post of private secretary and almoner to Pio Nono himself had to be accorded to him. Nothing else stands between him and the purple of the cardinal, but the fact that he is not yet thirty. It is thought, however, that the law may be varied to suit the case, and that, on the decease of Pio IX., he may be made pope, through the influence of Napoleon III.....Lippincott, of Philadelphia, has bought the copyright lately held by Phillips, Sampson & Co., and will hereafter be the exclusive publisher of the Prescott histories.....The Spanish mackerel, a "game fish" of the southern waters, has appeared in the Hudson river, and furnished sport for fly fishermen.

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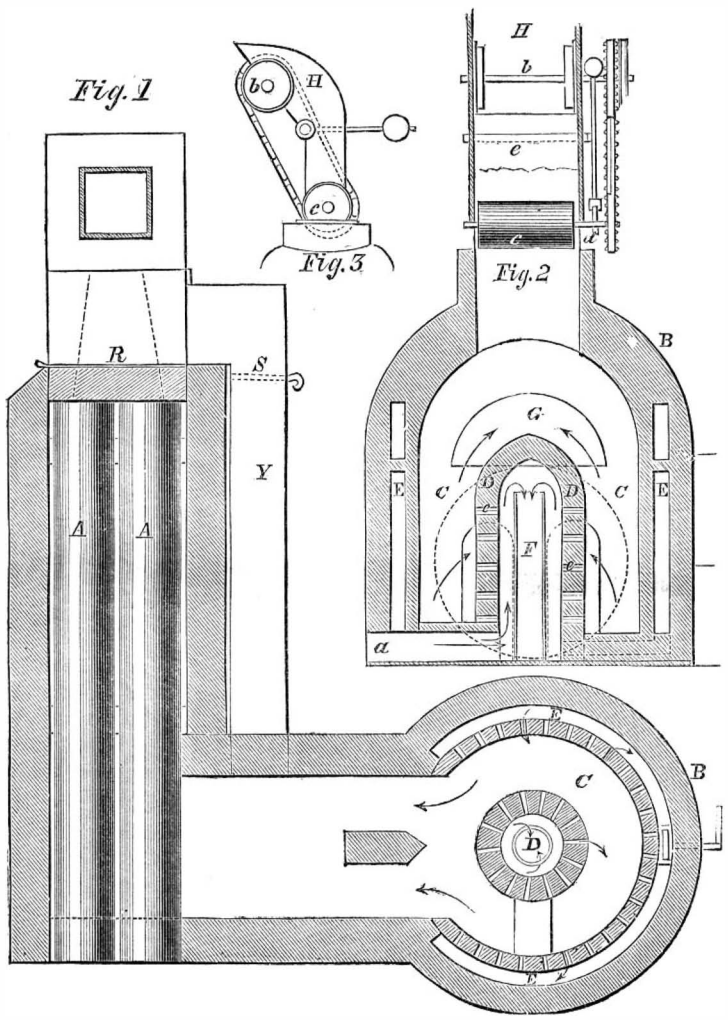
IMPROVEMENT IN BAGASSE FURNACES.

When the juice is pressed from sugar cane, the woody fiber remaining is called "bagasse," and this is dried and used as fuel for evaporating the juice. As it difficult to dry the bagasse thoroughly, much ingenuity has been employed in constructing furnaces to burn it when partially dried, and the accompanying engravings illustrate one of the results in this class of furnaces.

Fig. 1 is a plan of the furnace and boilers, and Fig. 2 a vertical section of the boiler; A A being the boilers, B, the furnace, C, the fire chamber, D, a central air chamber for supplying hot-air to the fire, and E E, an air chamber in the walls, partly surrounding the fire, also for the purpose of supplying hot-air. The fuel is introduced, as usual, into the crown of the furnace through the hopper, H, and falls into the chamber, C. The air enters through the flue, *a*, and fills the skeleton chamber, D, where it is heated; from the chamber, D, a portion of the air passes through the openings, *e e*, directly into the fire, and another portion, passing over into the flue, F, is carried into the chamber, E E, in the walls of the furnace, where it receives a further accession of heat, and is then admitted through openings in the wall into the fire. The chamber, E, is divided by a horizontal partition into two parts, the communication between which is closed by a damper, so that the lower one only need be used when the furnace is partly filled with fuel, and that both may when it is entirely filled. The heated air and gases from the upper air chamber are conducted from the furnace by the flue, *g*, and those from the lower air chamber by a separate flue, to a mixing chamber on their way to the boilers, in which chamber they are thoroughly blended together, so that any uncombined oxygen in the one may come in contact with any unconsumed gases in the other, and the combustion be thoroughly completed. From the mixing chamber, they pass under the boilers, and, imparting their heat to the juice, evaporate its volatile portions. To regulate the heat, the flue under the boilers is provided with the damper, *r*; and a waste flue, Y, also furnished with a damper, *s*, is constructed to carry off the heated gases and air, when it is desired to diminish or discontinue the heat to the boilers.

The feeding apparatus is illustrated in Figs. 2 and 3. The bagasse is spread upon an endless belt, which passes over the drum of the shaft, *b*, and receives motion from the machinery of the sugar mill, thus carrying the bagasse over the drum and dropping it upon the valve, *e*. This valve is connected with a rod which rests upon the cam, *d*, in such manner that the valve is turned at each revolution of the shaft on which the cam is placed. The cylinder, *c*, is hollow, with an opening on one side to receive the bagasse, and the cam is so placed on the shaft as to open the valve and drop the bagasse precisely at the moment when the opening in the cylinder, *c*, is turned up to receive it; after which the valve instantly closes, and the cylinder, in its revolution, drops the bagasse into the furnace. The object of this arrangement is to prevent the escape of sparks and heat from the furnace during the process of feeding the fire.

The patent for this invention was issued (through the Scientific American Patent Agency) Nov. 22, 1859, to A. J. Chapman, of Bayou Goula, La., to whom inquiries for further information may be addressed.



CHAPMAN'S BAGASSE FURNACE.

A DELIGHTED INVENTOR.

The writer of the annexed letter visited our office last month, bringing his model with him from Jackson, Tenn. During the few days he remained in this city we prepared his specification and drawings, and forwarded them with the model to the Patent Office. Immediately after the papers were executed, the inventor quitted New York, and we supposed had returned to his home in Tennessee; but from his letter we learn that he stopped on his way at the Patent Office, to see how his business was being attended to; and the following brief letter relates his experience among the officials:

MESSRS. MUNN & Co:—Through your efficient agency the Patent Office has granted all the claims in my application for a patent on improvements in sewing-machines. I have visited the Office every day since I left New York, and have made the acquaintance of a number of the officers. I find them to be dignified, intelligent and honorable gentlemen, seemingly well suited to successfully conduct the various and complex departments of that truly great institution. None can conceive the amount of mechanical genius that is developing in our country, until they visit the Patent Office. I would advise inventors who bring or send on the products of the ingenuity, to employ only those agents who are widely known as talented and experienced men in their profession, for I find much depends on a judicious preparation of papers.

Your obliged friend, G. W. MITCHELL.

Washington, Dec. 5, 1859.

SUBTERRANEAN FORESTS.—The Racine (Wis.) *Advocate* states that in digging for water, in sloughs, throughout the whole town of Yorkville, Racine county, traces of dense tamarack forests are found, and generally in a leaning direction, their tops towards the southeast, as though some mighty flood had suddenly overwhelmed them.

INDIA-RUBBER LIQUID—WATERPROOF LEATHER REMOVING MILDEW, &c.

MESSRS. EDITORS:—I take the opportunity of communicating some information on various subjects suggested by reading the SCIENTIFIC AMERICAN. In No. 18, this volume, there are some remarks regarding the removal of mildew from clothes. The best remedy that I have found for mildew is aqua ammonia, diluted with eight times its volume of water. When applied with a sponge it removes the mildew, which is a minute fungus, and it also restores the color to silks and gloves.

If the person noticed in your columns, who denied that india-rubber could be dissolved by turpentine, had made a correct experiment before he challenged your authority, he would have saved himself from a thrashing by his father. I have used a solution of india-rubber and turpentine for about twenty years, as a waterproof varnish for my boots and shoes. I make the application before blacking is put on, or else remove the blacking by water. When the leather is moist I take the solution of india-rubber and apply it with a rag, taking care to rub it in; then I put the boots in a moderately warm place until the whole is absorbed. The process is repeated twice, or until the pores of the leather are filled, when the surplus is wiped off. In a few days afterwards blacking may be put on, and the leather will polish well. By this method of treating my boots I make them not only water-tight, but also more durable, and the leather is always kept soft and pliable. I treat every pair of new boots in the manner described, and effect a considerable annual saving thereby.

In a recent article which appeared in the SCIENTIFIC AMERICAN, on "Chemistry and Street Dirt," it was stated that hydrochloric acid had been used for laying the dust in the city of Lyons, France, by sprinkling the streets with this acid. I am aware that strong acid would not answer to be used for this purpose, but diluted it may be employed, as it is produced in some cities in Europe in great abundance, and is very cheap, almost worthless. When the streets are macadamized with limestone the diluted acid will unite with the dust and form hydrochlorate of lime, which is of a very hygrometric character.

On page 297, there is a short extract about flavoring tobacco, to make the indifferent qualities equal to Havana. It is stated that Professor Liebig has made such a discovery, but a strong doubt is thrown out against the veracity of the statement. Permit me to state that I have succeeded in giving the artificial flavor of pine-apple, strawberry, peach, quince, &c., to tobacco; and why may not the flavor of the genuine Havana be imparted to any kind of tobacco, by similar chemical processes? My method has been to apply the chemical to the tobacco before it is made into cigars; a slight fermentation is induced, which entirely changes the flavor of the smoking weed.

You are correct about lightning-rods being conductors when well arranged, and that they not only conduct surcharges of positive electricity from the atmosphere, but surcharges of negative from the earth upwards. It is generally believed that the beech tree is an excellent non-conductor, and that the Indians seek shelter under them during thunder storms.

T. A. H.

Beardstown, Ill., Dec. 7, 1859.

[We have frequently heard it said that the beech tree possesses the qualities stated by our correspondent, and that the aborigines are in the habit of doing as represented by him; but it would be more wise for them to seek shelter under a good conductor than under a poor one. We believe the beech tree is a good conductor, and for this reason it is seldom struck by disruptive charges; it carries off the lightning silently.—EDS

AMERICAN LOCOMOTIVES.—The Philadelphia *Ledger* states that there is now completed at the works of M. Baldwin & Co., of that city, a splendid passenger locomotive (for the Southern Pacific Railroad Company) which weighs 17½ tuns. The track over which the engine is to run is 5½ feet wide. It has been named "Sam. Houston." There are also in the shop, and nearly finished, two eight-wheel freight engines, for the Havana Railroad Company, each weighing 22½ tuns, and intended for burning coal; the company having, by experiment, ascertained that the cost of running an engine is about one-half, when coal is used in preference to wood. This result has followed the introduction of all the coal-burners made by this firm. There are also in the shop two fine engines for the Pensacola and Florida Railroad, each weighing 17½ tuns, one for the Western Maryland Road, and three for roads in North Carolina.

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VOL. I., No. 25.....[NEW SERIES.].....*Fifteenth Year.*

NEW YORK, SATURDAY, DECEMBER 17, 1859.

BENEFICIAL PUBLIC WORKS.

PUBLIC works of acknowledged utility have always been of great benefit to the people, however vast may have been the sums expended upon their construction It is sometimes very difficult, however, to make a distinction between works of utility and those of an opposite class. The pyramids of Egypt are great public works, and prodigious must have been the wealth and toil lavished upon them; but it is doubtful if they have been of the least benefit to the people of that land, from the age in which they were erected up to the present day. They are wonderful exhibitions of ancient power and engineering skill, but they have served no useful purpose whatever. On the other hand, the great aqueducts of Egypt and the extensive artificial lakes of Ceylon, which were executed for collecting waters for irrigation, were works of utility, because they yielded practical benefits to the people. In this class we place all such aqueducts as that of New York, which is 40 miles in length, and is carried over deep rivers and valleys; because it supplies the people with a most necessary element of life. Most of our canals and railroads are also beneficial public works in the highest sense; because they are highways of general travel, and afford facilities of communication for every useful purpose. At present, there seems to be a feeling prevailing in the public mind somewhat adverse to great public works as national undertakings. This feeling has arisen from the want of success in some steamship companies and the disastrous results of a great many railroad investments. Yet for all this, it is positively certain that the want of success in such cases has been mostly owing to bad management, and no blame should be attached to the public works themselves for the results. One thing is certain, that, however much some individuals may have suffered, who had invested in some of our railroads, these agencies themselves have vastly benefited the whole country by the simple increase in the value of property in all those sections through which they pass. The direct results of all these public works have been beneficial to the people, therefore every proposed new public work should meet with the most candid consideration. The great tubular bridge at Montreal—which is nearly two miles in length and cost about $6,500,000—is a questionable work, we think, so far as being profitable to the railroad company for which it is being erected, but we have no doubt of it proving a great benefit to the people of Canada. Were a lofty and secure bridge or a safe submarine tunnel constructed between New York and Brooklyn to supersede the ferriage of the East river, who could avoid concluding that it would be a great work of public utility?

We are strongly in favor of encouraging great national works when they embrace the element of utility. A general enthusiasm ought to reign in the minds of the people in favor of such undertakings, because they advance the power, elevate the character and increase the wealth of every nation. But it may be said, do not the people require more than mere food and drink—those elements which our canals, aqueducts and railroads are only designed to supply or afford facilities for supplying? Must not the *mind* of the people be provided with its peculiar food and drink also? If so, then are not national works, such as temples, picture galleries, statues, gardens and parks, also of public utility, on account of the aliment which they furnish to the mind? These are questions which must be answered in the affirmative; man is a *dual* being, and his mental as well as his physical requirements should not be neglected.

Hitherto, owing to this country being so young, the most necessary public wants had to be first supplied; hence our great extent of artificial inland navigation and our long lines of railroads, which comprise more miles in length than those of all other countries put together. But now the country is powerful; it is rich and productive; and our people can and should devote more attention to public works, embracing the *utile dulci*. The New York Central Park (lately described in our columns) is a work of public benefit, although it never will bring a cent of revenue into the public treasury, like the Croton Water-works or a railroad. It may cost $10,000,000 to complete it, but the benefits which it will secure to the people, by furnishing enjoyment for their higher nature in all that relates to cultivated rural beauty, will be ample compensation for all the money expended and labor bestowed upon it.

In our last number we adverted to the growing taste, genius and skill of our people, in relation to the fine arts. It affords us pleasure to know that they are encouraged by many of our more wealthy citizens; still, our patronage of the arts is far more of an individual than a national character. Our ablest American sculptors reside in Italy; they have to make that country their home. We have no public museums-of-art and schools-of-design in which our youth may study and improve. There should be an American individuality in our works of art, but this we cannot expect until we have national public schools-of-art, like those of Italy and France. We should have our national enthusiasm aroused on this subject, for our country has now attained to an age and position when we should provide ourselves with all the superior productions of a highly cultivated and refined people. We already have American artists; let us also have more American *art*, and thus foster every species of public national productions that are capable of elevating and benefiting the people.

JOHN BULL IN A RAGE.

Our venerable uncle, John Bull, appears to be a good-natured sort of old gentleman upon most occasions; but sometimes he gets into fits of almost uncontrollable rage. The account which we gave on page 240 of the present volume of the SCIENTIFIC AMERICAN, regarding the successful trial of two American locomotives with two English engines, has stirred him up, and he has become furious, and bellows most vociferously against us through the columns of the London *Engineer*. Our cotemporary sneeringly says: "The Americans, we understand, first invented locomotives; and, being a traveling public—never at rest, but always on the move—it was natural they should have carried the invention to a pitch of perfection of which we, benighted Britishers that we are, should have no conception. The SCIENTIFIC AMERICAN, with its usual accuracy in matters of railway information, announces that a trial of English and American engines has come off on the Southern Railway of Chili; the English engines, of course, were nowhere." It then enters upon a long criticism of the statistics of performance given on the page referred to, for the purpose of showing that the results said to have been attained by the American engines were impossible. We have not space to quote these, and it would be a waste of room to do so. We distinctly stated that "we had not been informed of the cause of superiority in the successful engine," and we gave the statements without note or comment as now. We direct attention to this question not for controversy, as there is no tangible point for discussion, but to show the vulgar *animus* prevailing in the *Engineer* against us. It uses such phrases as—"We might as well hang up our fiddle and go home." "This is a kind of lying to which the Americans appear to be greatly given." Such expressions afford evidence of the spirit which actuated our cotemporary and roused his anger at the victory of our engines over those of England on this trial. It has never been contradicted, so far as we know, that the American locomotives were completely successful in this trial, and since such is the case, it is mere "leather and prunella," to waste a single argument in answer to the faults which the *Engineer* finds with the published reports of it. Some incorrect statements may have come from Chili in relation to some of the particulars of this case, but while the main facts stand out impregnable, our cotemporary appears to us like an envious man throwing mud at his neighbor's sign-board.

FORFEITURE OF PATENTS.

Our patent laws, which were made ostensibly for the purpose of protecting inventors in their rights, contain some features which are not only objectionable but very unjust. We have lately received a letter from a correspondent, in relation to the patent of J. Young, for manufacturing coal oil (described on page 186, Volume XIV, of the SCIENTIFIC AMERICAN) in which we are informed that the assignees have commenced suits against several parties for its infringement. The defense relied upon, we are informed, is forfeiture of the patent for non-compliance with the provision of the patent law contained in Section 15, of the Act of 1836. By that clause a patent is forfeited "when the patentee, if an alien, at the time the patent was granted, had failed and neglected for the space of 18 months from the date of the patent to put and continue on sale to the public, on reasonable terms, the invention or discovery for which the patent was issued." We know nothing about the claims or interests of the assignees of Young's patent. They may have paid a large sum for it, or they may have paid a very small amount for aught we know. Their motives for pursuing other parties may be founded upon even and exact justice, or they may be of the most avaricious and grasping character. These things we will not mix up with this question; our voice is simply raised in behalf of the honest inventor, whoever he may be, and wherever he may sojourn.

We have no sympathy with those who, in any patent suit, place their defense against the claims of an inventor, upon the plea of forfeiture of his patent. A defense against a patent may be successful upon such a plea, but who would envy those that obtained such a victory? We look upon the forfeiture feature of our patent law with repugnance; we feel ashamed of it, because it is borrowed from old statutes of despotic countries—from ages when all legislation was carried out for the crown and none for the people. We look upon inventors as the public benefactors of all countries; and in the present day, when "knowledge runs to and fro," and when there are such facilities for communicating ideas, a good improvement in one country soon finds its way into others. For these reasons, inventors should be looked upon as citizens of the world, and every encouragement should be offered and every protection afforded to them by all civilized countries. The forfeiture of a patent to an American in Europe, if he were disabled to introduce it into public use and continue it on sale within 18 months after it was granted, we would hold to be a narrow minded and unjust action; and we therefore cannot look upon that clause in our patent law in any other light, as it regards those foreign inventors who have taken out patents in the United States. It may be said that "such a clause is very easily complied with." We do not think it is because it compels a patentee either to put his patent on sale, if for a process, or his article or machine, if his patent is for an improvement in mechanism or manufactures. In regard to new inventions, the oppressive character of such a law can be appreciated by inventors better than any other class. The patent for coal oil is an example. It requires considerable capital to engage in this business, and thus a poor inventor may be prevented from exhibiting his process advantageously. Persons possessed of funds are necessary to him in such a case, but his very poverty operates against him to satisfy such persons of the value of his improvement. We can easily conceive the difficulties under which the patentee of that discovery labored to introduce his invention and present it for sale within 18 months after the issue of the patent. The same disadvantages are frequently experienced with other inventions. Inventors are well acquainted with the obstructions which they sometimes meet with in the operations of new and useful inventions, even after the patents have been granted for them. It sometimes takes not only 18 months, but several years, before the main idea embraced in a new machine is so applied as to satisfy the patentee that he may offer it for sale. Under such circumstances, it would be suicidal to his interests to offer his invention to the public.

We are confident that every patentee in this country will endorse the truth of these statements, and when this

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is the case with inventors at home, how much more is it applicable to those who take out patents in foreign countries? It is our opinion that the clause of forfeiture in our patent code should be so amended as to allow foreign patentees a longer period of time for the introduction and sale of their inventions. The law should require them to make reasonable efforts for the introduction and sale of their inventions to the public, from the very day their patents are issued, but nothing more as a cause of abandonment to the public. These views have been drawn out by a consideration of the contents of the letter referred to. Our sympathies are with inventors; and in seeking a just and full protection for their rights, we believe we are promoting the interests of the country, and those of the capitalists who encourage new improvements and assist in the development and introduction of new and useful discoveries.

SCIENTIFIC NEWS.

Electricity of the Atmosphere.—The Manchester (Eng.) Literary and Philosophical Society, of which William Fairbairn, C. E., F. R. S., is president, is one of the most scientific and useful to be found anywhere. In addition to the interesting information on light and color which we published last week, as being elicited at one of the meetings of that institution, a letter was also read from Professor Thomson, of Glasgow, in which he described a simple apparatus for observing changes in atmospheric electricity. It consists of an insulated vessel about one foot in hight, containing water, and set under the window-sill of a house, to communicate with the outside, by a very small discharge-pipe, two-and-a-half feet long. The head of water in the vessel is maintained at about ten inches, and the small discharge pipe has an orifice less than that of a tobacco pipe. By the slow discharge of water, and its exposure to the atmosphere, this vessel, in its insulated position, acts like an electric barometer, to show variations of atmospheric electricity, and communicate them to an electrometer connected with it. During dry weather and the prevalence of east winds, the electrometer always indicated high positive electricity in the atmosphere, and the reverse during wet weather and westerly winds. On the Atlantic coast of the United States, we understand that the reverse phenomena take place during east winds. The electrometer then indicates a diminution of positive electricity in the atmosphere, accompanied with rain, while an increase of positive electricity takes place during westerly winds, which are usually dry.

Iron for Steamers.—The recent loss of the iron steamer, *Royal Charter*, by the sudden and unexpected breaking up of her hull, has called forth a considerable amount of useful information in regard to the quality of metal of which some steamships have been built. It is well known that the *Great Britain* went ashore on the coast of Ireland, several years ago, and withstood the terrible buffetings of the ocean waves for several months almost without any injury to her iron hull, while other iron vessels have been broken to pieces in a short time after they were stranded. The natural inquiry has arisen: "Why is this?" It has been answered satisfactorily by the statement that some iron ships are built with "boat-plates," a very inferior quality of metal, worth only about $45 per tun, while the best plates—those of a quality suited for locomotive boilers—cost about $150 per tun. In a vessel of 1,000 tuns burthen it only costs about $2,000 extra, for the best plates, and yet, so "penny wise and pound foolish" have been several owners of iron vessels that they have chosen the cheap and unreliable in preference to the safe and better quality of iron.

Speed and Size of Ships.—A question has frequently been asked: "Has the speed of steamships increased in the ratio due to their size?" Vice-admiral Moorsom, of the Royal Navy, who has given great attention to this subject, states that he is not enabled to answer this question, from all his experience with, and observation of steamers. He says that reliable information on this point would be valuable to science.

Iron Streetways.—It is proposed to lay down iron wheelways in some of the streets of London. It is to be composed of boxes honey-combed or crossed diagonally, like the cast-iron pavement in Nassau-street, New York, and to have the spaces between the tracks filled in with small granite blocks. The iron wheelways are stated to be more durable than granite, and preferable for laying down and taking up quickly when required for excavating, to get at sewers and gas-pipes.

Boiler-feeders.—A self-feeding injection apparatus is now being employed on some of the French locomotives, as a substitute for the common force feed pump. It consists in a jet of steam being admitted from the boiler into a tube leading the water from the tank into the boiler, and by its condensation a partial vacuum is formed whereby the water is drawn into the boiler, even against the pressure in it. We cannot conceive how water can be fed into a boiler by the vacuum pressure of 15 pounds on the square inch against a pressure of 100 pounds; but on the Lyons Railway the apparatus is stated to have been fitted to all the locomotives, and Messrs. Sharp & Stewart, locomotive builders, Manchester, England, have commenced o put the arrangement on several of their engines.

Locomotive Engines.—The first of a series of eight locomotives has just been built for a railroad at the Cape of Good Hope, by Messrs. Hawthorne, of Newcastle, and it has made several trial trips. It possesses some peculiarities. The cylinders are outside, and the engine and the works are built independently of the boiler, which can be detached and taken from the working parts. It has four driving-wheels, each five feet in diameter, and one pair of hind running-wheels, three-and-a-half feet in diameter. A donkey pump is situated near the engineer, for feeding the boiler, and a steam-pipe is conducted so as to extinguish the fire in a minute, if necessary, and also for the purpose of sweeping out the flues, all of which appear to be good arrangements.

Mr. Lever has again offered to charter the *Great Eastern* for twelve months, but the proposal was refused without hesitation by the directors.

The official investigation into the loss of the *Royal Charter* is progressing in Liverpool, but without developing anything new. Divers at the wreck have brought up several small boxes of gold.

The Society of Arts have inaugurated a movement for a great International Exhibition in London, in 1862. They propose to raise a guarantee of £250,000.

The British metal market has scarcely changed since we published our last table. The Scotch pig-iron has somewhat improved; all the other metals are steady at former prices.

FORMATION OF DIAMONDS.—A writer in one of the German scientific magazines gives it as his opinion, founded on carefully conducted experiments, that the diamond is the product or condensed carbon, crystallized from liquid carbonic acid. It is known that diamonds not rarely show cavities in which, according to all appearances, a considerable pressure must have taken place. Supposing these cavities to contain some kind of gas, it is argued that there is no reason why this might not be carbonic acid under a high pressure, and this theory would furnish a ready explanation, it is thought, of the color-rings with black crossings observed around the cavities in diamonds, by supposing them to be caused in a similar manner as those of unevenly compressed glass. The carbonic acid then stands in the same relation to diamonds, as the mother ley inclosed in a number of artificial and native crystals. That there are large quantities of carbonic acid under a high pressure in the body of our planet, is shown by the immense quantities escaping at various localities.

THE "GREAT EASTERN" BLUNDER.—A paragraph has been copied into the columns of several of our cotemporaries, credited to the London *Times*, in which the paddle-wheel shaft of this great steamer is stated to have been placed far too low. This engineering error is said to have been discovered since she went back the last time to Southampton, and it is asserted that it will be fatal to the success of the vessel under the present arrangement of machinery. Without any cargo on board, the paddles require so much reefing that when she is loaded, the wheels must necessarily be buried too deep in the water. Perhaps these statements have no foundation in fact; we are inclined to consider them great exaggerations. The correspondent (Tubal Cain) of the New York *Times*, who was on board of the *Great Eastern*, and explored it intelligently from end to end, would have detected such a gross engineering error, we think, had it existed.

NEW YORK MARKETS.

CANDLES.—Sperm, city, 38c. a 40c. per lb.; sperm, patent, 50c.; wax, paraffine, 50c.; adamantine, city, 18c. a 21c.; stearic, 27 a 28c.

COAL.—Authracite, $4.50; Liverpool orrel, $10; cannel, $12.

COPPER.—Refined ingots, 23c. per lb.; sheathing, 26c.; Taunton yellow metal, 20c.

CORDAGE.—Manilla, American made, 8¼c. per lb.; Rope, Russia hemp, 12c.

COTTON.—Ordinary, 8¼c. a 8¾c.; good ordinary, 9⅛c. a 10c.; middling, 11⅜c. a 11⅞c.; good middling, 11⅞c. a 12⅜c.; middling fair, 13¼c.

DOMESTIC GOODS.—Shirtings brown, 30 inch per yard, 6c. a 7⅛c.; shirtings, bleached, 26 a 32 inch per yard, 6c. a 8c.; shirtings, bleached. 30a 34 inch per yard, 7c. a 8⅛c.; sheetings, brown, 36 a 37 inch per yard 5¼ c. a 8¾c.; sheetings bleached, 36 inch per yard, 7½c. a 15c.; calicoes. 6c. a 11c.; drillings, bleached, 30 inch per yard 8¼c. a 10c.; cloths, all wool, $1.50 a $2.50; cloths, cotton warp, 85c. a $1.37; cassimeres, 85c. a $1.37½; satinets, 30c. a 60c.; flannels. 15c. a 30c.; Canton flannels, brown, 8½c. a 13c.

DYEWOODS.—Fustic, $18 a $38 per tun, according to quality; Logwood, Laguana, $24; Jamaica, $12, Lima wood, $65 a $75; Sapan wood, $45; Barwood, $17 a $17½; Camwood, $130.

FLOUR.—State, superfine brands, $5.10 a $5.20; Ohio common brands, $5.30 a $5.35; Michigan, Indiana, Wisconsin, &c., $5.30 a $5.45; Genesee, extra brands, $5.75 a $7.50; Missouri, $5.35 a $7.50; Canada, $5.40 a $6.35; Richmond City, $6.50 a $7.25; Rye flour, fine $4 a $4.40; corn meal, $4 a $4.10.

HEMP.—American undressed, $120 a $150; dressed, from $160 a $200. Jute, $87 a $90. Italian, $275. Russian clean, $190 a $200 per tun. Manilla, 6¼c. per lb. Sisal, 5¾c.

INDIA-RUBBER.—Para, fine, 60c. per lb.; East India, 50c.

INDIGO.—Bengal, $1 a $1.55 per lb.; Madras, 70c. a 95c.; Manilla, 60c. a $1.15; Guatemala, $1 a $1.25.

IRON.—Pig, Scotch, per tun, $23.50 a $24; Bar, Swedes, ordinary sizes, $87 $90; Bar, English, common, $42.50 a $43; Sheet, Russia, 1st quality, per lb., 11¼c. a 11⅝c.; Sheet, English, single, double and treble, 3⅛c. a 3⅞c.; Anthracite pig, $24 per tun.

IVORY—Per lb., $1.25 a $1.80.

LATHS.—Eastern, per M., $2.37½.

LEAD.—Galena, $5.80 per 100 lbs.; German and English refined, $5.65; bar, sheet and pipe, 5¾c. a 6c. per lb.

LEATHER.—Oak slaughter, light, 29c. a 30c. per lb.; Oak, medium, 30c. a 32c.; Oak, heavy, 28c. a 31c.; Oak, Ohio 29c. a 30c.; Hemlock, heavy, California, 19c. a 20c.; Hemlock, buff, 15c. a 18c.; Cordovan, 50c. a 60c.; Morocco, per dozen, $18 to $20.; Patent enameled, 16c. a 17c. per foot, light Sheep, morocco finish, $7.50 a $8.50 per dozen.; Calf-skins, oak, 57c. a 60c.; Hemlock, 56c. a 60c.; Belting, oak, 32c. a 34c.; Hemlock, 28c. a 31c

LIME.—Rockland, 80c. per bbl

LUMBER.—Timber, white pine, per M feet, $17.50; yellow pine, $35 a $36; oak, $18 a $28; eastern pine and spruce, $14 a $15½; White Pine, clear, $35 a $40; WhitePine, select, $25a $30; White Pine, box, $14 a $18; White Pine, flooring, 1¼ inch dressed, tongued and grooved, $24.50 a $25; Yellow Pine, flooring, 1¼ inch, dressed, tongued and grooved, $29 a $32; White Pine, Albany boards, dressed, tongued andgrooved, $20 a $21; Black Walnut, good, $45; Black Walnut, 2d quality, $30; Cherry, good, $45; White Wood, chair plank, $42; White Wood, 1 inch, $23 a $25; Spruce Flooring, 1¼ inch, dressed, tongued and grooved, each, 22c.a 24c.; Spruce Boards, 15c. a 17c.; Hemlock Boards, 12½c. a 14c.; Hemlock wall strips, 10c. a 11c.; Shingles, cedar, per M, $28 a $35; Shin les, cypress, $12 a $25; Staves, W. O. pipe, light, $55 a $58; Staves, white oak, pipe, heavy, $75 a $80; Staves, white oak, pipe, culls, $30 a $35; Staves, do. hhd., heavy, $70; Staves, do. bbl. light, $30 a $35; Staves, do. bbl. culls, $20; Mahogany—St. Domingo, fine crotches, per foot, 35c. a 45c.; St. Domingo, ordinary do., 20c. a 25c.; Honduras, fine, 12½c. a 15c.; Mexican, 13c. a 15c.

NAILS.—Cut, 3¼c. a 3⅜c. per lb.; American clinch, 5c. a 5½c.; American horse-shoe, 14¼c

OILS.—Linseed, city made, 56c. per gallon; linseed, English, 56c.; whale, bleached winter, 59c. a 60c.; whale, bleached Fall, 58c.; sperm, crude, $1.38; sperm, unbleached winter, $1.45; coal oil. $1; lard oil, No. 1 winter, 87c. a 92½c.; refined rosin, 30c. a 40c.; camphene, 45c. a 47c.; fluid, 53c. a 56c

PAINTS.—Litharge, American, 7c. per lb.; lead, red, American, 7c.; lead, white, American. pure, in oil, 8c.; lead, white, American, pure, dry, 7¼c.; zinc, white, American, dry, No. 1, 5c.; zinc, white, French, dry, 7¼c.; zinc, white, French, in oil, 9½c.; ochre, ground in oil, 4c a 6c.; Spanish brown, ground in oil, 4c.; Paris white, American, 75c a 90c. per 100 lbs.; vermillion, Chinese, $1.12½ a $1.22; Venetian red, N. C., $1.75 a $2.25 per cwt.; chalk, cash, $4 per tun.

PLASTER-OF-PARIS.—Blue Nova Scotia, $2.75 per tun; white, $3; calcined, $1.20 per bbl.

RESIN.—Common, $1.55; per 310 lbs.; strained, No. 2, &c., $1.50 a $1.87; No. 1, per 280 lbs. $1.90 a $3; white, $3 a $4; pale, $4.50 a $5.50.

SPELTER plates, 5c. a 5¼c. per lb

STEEL.—English cast, 14c. a 16c. per lb.; German, 7c. a 10c.; American spring, 5c. a 5½c.; American blister, 4½c. a 5½c.

SUMAC.—Sicily, $65 a $80 per tun.

TALLOW.—American prime, 10¾c. per lb.

TIN.—Banca, 31c.; Straits, 30c.; plates, $6.25 a $9.50 per box.

WOOL.—American, Saxony fleece, 55c. a 60c. per lb.; American full blood merino, 48c. a 52c.; extra, pulled, 45c. a 50c.; superfine, pulled, 39c. a 43c.; California, fine, unwashed, 24c. a 32c.; California, common, unwashed, 10c. a 18c.; Mexican, unwashed, 11c. a 14c.

ZINC.—Sheets, 7c. a 7½c. per lb.

The foregoing rates indicate the state of the New York markets up to December 8th.

The cotton market has remained steady in prices. There has been a slight change in flour and leather last week, the latter falling a mere trifle in price.

Eastern spruce and pine have improved and advanced, but no changed in other sorts of lumber.

Throughout the New England districts, and especially in Boston, trade is represented to be livelier, and a more general disposition is manifested to invest in manufactures.

Hemp has somewhat advanced in price at St. Louis, owing to holders asking $5 more per tun for it, but there has been no increase in the sales.

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WEEKLY SUMMARY OF INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

SUGAR-MAKING MACHINE.

This invention consists in subjecting sugar cane or saccharine juices to the action of fumes of burning sulphur. The fumes are supplied in thin sheets or streams from a retort, and the juices fall in spray or minute particles through said fumes. The inventor proposed, as a modification of his invention, that the sulphur fumes be forced through the juices. This is a very useful invention; it defecates and clarifies the juices to such an extent (at the first operation) that the subsequent clarification and defecation by any of the salts, alkalies or acids, are rendered very easy and expeditious. This invention has been patented by the inventor's executrix, Mrs. Nancy P. Brashear, of the parish of St. Mary, La.

IMPROVEMENT IN PROJECTILES FOR RIFLED ORDNANCE.

John Webster Cochrane, of this city, has patented an invention which consists in fitting a projectile with a hollow case, jacket or band, having within it a chamber or the reception of gunpowder, gun-cotton, or other explosive substance, to be ignited by fire from the charge of the gun, for the purpose of causing the said case, jacket or band to be, at the same time, expanded toward the bore and rifle grooves of the gun, and compressed around the projectile, and thereby preventing windage between the projectile and the bore and grooves, and causing the rotary motion derived by the case, jacket or band from the rifle grooves, to be imparted to the projectile. It also consists in the employment, in combination with an expanding jacket or case applied to a projectile, of an outer covering of copper or other wire cloth, to constitute a packing between its exterior surface and the bore and grooves of the gun.

IMPROVED MACHINE FOR FORMING HAT BODIES.

This invention consists in a novel way of distributing and presenting the fur to the "former," whereby the fur is deposited on the former with a very even graduation, and by a very simple means. It also consists in a peculiar arrangement of the driving mechanism of the former, its suction chamber and slide, whereby the former may drawn from its working position, and its rotations automatically stopped for the removal of the formed body, and shoved back again in working position, and automatically set in motion to receive the fur for the formation of the succeeding body. It further consists in the use of revolving cards or pickers, placed within a stationary and concentric shell, also provided with cards or pickers, and used in connection with fan blades or wings for properly disintegrating the fur or loosening its fiber, and discharging the same over and around the former. The inventor of this improvement is Richard Fitzgerald, of Newark, N. J.; the assignee is James Booth, of the same city.

IMPROVEMENT IN SEWING-MACHINES.

Edwin Clark, of Windsor, Vt., has patented an improvement in that class of sewing-machines which is known as the "double-looped stitch." The invention consists in a novel and very simple mode of operating the needle, whereby the stich-making operation is rendered more certain than in many other machines for making the same kind of stitch.

IMPROVED ROTARY CUTTER HEADS.

J. P. Tice, of Baltimore, Md., has taken out a patent for an improvement in the above machine, which consists in having the cutters placed in such relation with a cylinder, or a segment of a cylinder, as to prevent any undue action of the cutters on the "stuff," so that the former cannot follow the grain of the wood and draw it suddenly along, thereby spoiling the work and endangering the hands of the operator. The invention also has for its object a perfect operation of the cutters on the stuff, so that the latter will be cut smooth and with a good finish, and the cutters allowed to be adjusted on their arbors as the nature of the work may require; the invention serving as a guide for the setting thereof. An engraving of a machine with this cutter head attached may be found in No. 21, present volume of the SCIENTIFIC AMERICAN.

IMPROVEMENT IN MELODEONS.

The object of this invention is to make the melodeon and other reed instruments of the same class capable of greater expression than those heretofore constructed; and, to this end, it consists in providing the instrument with what may be called "swell valves" (one for each key), so applied in connection with levers, or their equivalents, that they can be operated at the pleasure of the player by the action of the keys in playing, for giving any desired degree of swell or expression to any note, irrespectively of the preceding or succeeding notes, or of the other notes of the chord. Charles G. Burke, of Utica, N. Y., is the inventor of this improvement.

IMPROVED CARDING-ENGINE.

This invention consists in certain improvements in feeding and forwarding the cotton from the "lap" to the main cylinder in carding-engines, and differs essentially from all others hitherto in use for the same purpose, where feed rollers and "lickers-in," commonly so-called, are employed, by dispensing with the use of both and substituting in lieu thereof a small cylinder clothed with strong, coarse card teeth, as a regulator for the uniform delivery of the lap and as a worker to the feeder; said feeder operating in connection with the regulator-cylinder, and, at the same time, serving to card on two other workers of different diameters, by reason of the invention of a working and clearing and delivering cylinder to the main cylinder; said working cylinder serving also to card on the main cylinder. The whole arrangement gives four working or carding points, instead of one, at the place where the cotton is first introduced. This appears to be a most excellent improvement. The inventor (Jeptha Dyson, of Fulton, S. C.), who is the patentee of the celebrated "Dyson's Stripper," has spent nearly his life time in cotton factories, and therefore knows what is wanted.

IMPROVEMENT IN HAY-MAKING MACHINES.

This invention consists in the employment of a friction roller or rollers attached to the ends of a reel shaft, which rollers are brought in contact with the inside surface of projecting rims of the driving-wheels, and by a peculiar manner of hanging the reel, will be brought to act upon the friction rollers, and keep them in contact with the said rims with sufficient force to create the necessary amount of friction to keep the reel in rapid rotation under all ordinary circumstances; but when the teeth or tines of the rakes come in contact with an obstruction, the rollers will slip upon the rims until the obstruction is passed. This invention also provides for the raising and lowering of the reel of rakes, by the driver, for avoiding obstructions, and for transporting the machine from place to place. It further consists in a novel device for contracting or extending the teeth of the rakes simultaneously. J. C. Stoddard, of Worcester, Mass., has received a patent for this improvement. See engraving in No. 23, present volume of the SCIENTIFIC AMERICAN.

IMPROVEMENT IN SEWING-MACHINES.

The inventor of the above improvement (George W. Mitchell, of Jackson, Tenn.) claims a novel and very simple combination of mechanism for driving the needle and shuttle or looper, whereby a sewing-machine is much simplified. The invention also consists in a certain novel and very simple construction of and mode of applying an elastic presser to confine the cloth or other material to the work-plate or bed of the machine, whereby it is made capable of operating as a feeder without any joints or other fittings. And it further consists in a novel contrivance through which the needle arm is made to operate upon the presser, for the purpose of producing the feed movement.

IMPROVED MODE OF SECURING WOODEN ROLLERS TO SHAFTS.

The printing-rollers employed in the manufacture of paper-hangings by machinery are commonly made of wood, and one shaft is made to serve for several rollers of different patterns, which are changed as occasion may require, and much difficulty has been experienced in so fitting and securing the rollers that they may be removed and replaced as often as desired, and always be perfectly concentric with the shaft. The object of this invention is to overcome this difficulty; and, to this end, it consists in a certain combination of conically-bored bushes fitted into the ends of the rollers, conical sliding collars fitted with feathers and grooves both to the shaft and bushes, and nuts fitted to screw-threads on the shaft, by which the truth of the several rollers upon the shaft is insured, and provision is made for adjusting the rollers lengthwise upon the shaft. The inventor of the above useful improvement is Theodore Van Deventer, of New Brunswick, N. J.

RAILROAD SPIKE.

This invention consists in giving to a rail spike head a peculiar shape, and also a supplemental lip projecting out behind its head, for allowing the insertion under it of an edged crowbar for drawing out the spike. It also consists in so forming the head of the spike that it will keep the nut guards in place, and securely lock them under the nuts of the rail bolts where nut bolts are used; and so that the heads of the spikes will fit beveled-shaped recesses in the nut-fastenings and brackets, or brace-bearing-pieces, and not only keep them in place, but prevent them from tilting or moving in any direction. Besides, the peculiar-shaped head given to these rail spikes is much stronger, and will adapt itself to all the various requirements of the ordinary hold-down spikes. G. W. R. Bayley, of Brashear, parish of St. Mary, La., is the inventor. A patent for this invention has been secured in England through the Scientific American Patent Agency.

WATER-WHEEL.

This invention consists in the peculiar means employed in relieving the steps of the wheel shaft of the weight of the wheel, and the pressure of the water on the buckets of the wheel, thereby greatly reducing friction. Also, in the use of a packing ring applied to the wheel and casing, for the purpose of compensating for any irregular movement of the wheel, and allowing the same to run water-tight. A gage or regulating-plate is also employed below the wheel, and arranged so as to regulate or control the discharge of water from the wheel, and obtain in all cases the maximum power due to the head, whether it be greater or less. This invention also consists in the peculiar form of the buckets for the purpose of retaining the water within the wheel, or preventing the water from being deflected upwards as if strikes the buckets. The inventor is James P. Collins, of Troy, N. Y.

COTTON LATITUDES.—The production and growth of cotton is a monopoly of climate, it cannot be successfully cultivated, except between the latitudes of 30 and 35 degrees; extending from the Atlantic to the Pacific oceans —a region of earth's surface 240 miles in width, and 2,000 in length. Much of this region is incapable, from sterility and other causes, to profitably cultivate this staple. It follows, as necessary consequence, that as the amount of cotton lands diminish, the remainder are rendered more valuable.

A POSTAL arrangement has just been proposed for carrying the United States mails to the Brazils, from and to this port. An efficient new line of steamers will soon be equipped to ply between New York and Rio, touching at St. Thomas, Bahia and Pernambuco. We ought to have had a line of steamers on this route years ago. We do a large amount of business with Brazil, and nine-tenths of our commercial correspondence has hitherto been maintained through the British mail lines. Our commerce with the South American States has been too much neglected by our government.

NEW STEAM FIRE-ENGINE.—The Chicago papers give glowing accounts of a new steam fire-engine which has lately been built for that city by Messrs. Silsby, Mynderse & Co., of Seneca Falls, N. Y. With a pressure of 60 lbs. steam, it threw a horizontal stream 340 feet out of an inch nozzle and 50 feet of hose. With $1\frac{1}{8}$ inch nozzle, it threw a perpendicular stream 150 feet.

NEW MINERAL REGION.—Very rich gold, silver and copper mines have just been discovered in Carson Valley, Cal. The Placerville *Observer* states that $4,400 of gold and $1,100 of gold were obtained from a tun of quartz. There are vast ledges of the silver ore, which on an average will yield about $5,000 to the tun.

THE CIGAR STEAMER.—This steamer, as we learn by our Baltimore exchange, has made a trip to Norfolk, Va., where she now is, and where a series of experiments are to be made under the direction of Messrs. Winans.

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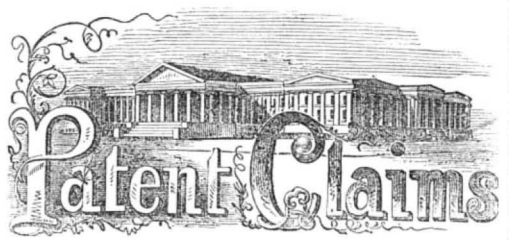

ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING DECEMBER 3, 1859.

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*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

26,330.—G. M. Atherton, of Friendsville, Ill., for an Improvement in Hub-boring and Mortising Machines:

I claim the arrangement of the pawls. S S′, with spring rods, P P′, and arms, V V, projecting from the reciprocating gate, L, for operating the same, in combination with lever, M, for relieving either one or both pawls from racks, T T′, the whole being arranged and combined for the purpose of moving the carriage with the hub up to the mortising tool, as set forth.

[This invention consists in arranging upon the inside of a suitable standard, two spring-rods, one on each side of a reciprocating gate, to which rods are pivoted two pawls which engage alternately with suitable racks upon the carriage by a lever working in a guide, so as to move the carriage simultaneously with the upward movement of the reciprocating gate for carrying the mortising chisel.]

26,331.—Wilson Ager, of Rohrsburg, Pa., assignor to T. J. Wolf and P. J. Jordan, of Philadelphia, Pa., for an Improvement in Machines for Clearing Rice:

I claim, first, Giving the grain a positive outward motion from under the pressing wings by the clearer, k, or its equivalent, situated and operating substantially as set forth.

Second, The adjustable leaves l, upon the wings, for aiding the upward movement of the grain.

26,332.—C. P. Buckingham, of Mount Vernon, Ohio, for an Improvement in Grinding Mills:

I claim, first, The improved method of securing the spindle to the runner stone of a grinding-mill, by combining the flanch, m, at the end of the spindle, I, and the ring, N, attached to the metal cap, O, of the runner, C, said ring being provided with projections, n, which shall permit a rocking motion of the stone upon the spindle, and a key p, or its equivalent, substantially as and for the purposes set forth.

Second, The use, in connection with the bed-stone, B, of the elastic bars. h, for the purpose specified.

[This invention relates to an improved mode of hanging the stones, whereby the same may be readily adjusted, and due provision made for the escape of foreign substances which may chance to pass between them and the running stone rotated with a true or even motion.]

26,333.—B. N. Burke, of Buffalo, N. Y., for an Improvement in Steam-boilers:

I claim the employment, in combination with flues arranged substantially as described, of draft distributors, E E, applied and furnished with apertures of varying size, substantially as specified.

[This invention consists in a certain system of draft distributors employed in combination with flues passing through a boiler, for the purpose of producing an equable diffusion of heat over the whole surface of the flues.]

26,334.—B. F. Campbell, of Roxbury, Mass., for an Improvement in Steam-boilers:

I claim the combination of the exterior water chamber, A, and interior water chamber, B, the interposed smoke flue, C, and the basin, F, the whole arranged to operate substantially as and for the purposes set forth.

26,335.—C. Carter, of Franklin, Iowa, for an Improved Washing Machine:

I claim the inclined washboard, C, fitted between ways or guides, b b, which have a sliding or reciprocating rubber frame, F, fitted on them by being hinged to slides, D D, the above parts being fitted within a suitable box, or suds' receptacle, A, and arranged to operate as and for the purpose set forth.

I further claim the arrangement of the rubbers, G H, filled within the hinged reciprocating frame, F, and used in connection with the inclined washboard, C, for the purpose specified.

[This invention consists in the use of an inclined corrugated washboard, placed within a box or suitable suds-receptacle, and used in connection with a reciprocating rubber frame and rubbers, the whole being so arranged that the desired work may be done with facility and in a thorough manner; the several portions of each piece or article to be washed, which require an excess of rubbing, being subjected to a degree of friction and to more or less rubbing, as may be required, without subjecting to undue treatment other portions not requiring it.]

26,336.—Edwin Clark, of Windsor, Vt., for an Improvement in Sewing Machines:

I claim the combination of bar, G, which has its front end or needle, a, controlled by a double fulcrum guide, d, so as to describe an ellipse, and its rear end attached to a rotating disk, or crank pin, with a perforating needle, n, as shown and described.

26,337.—J. W. Cochran, of New York City, for an Improvement in Projectiles for Rifled Ordnance:

I claim fitting a projectile with a hollow case, jacket or band containing gunpowder or other explosive material, which, when ignited by the firing of the charge of the gun will, by its explosion, cause the said case, jacket or band to be expanded toward the bore of the gun, and to be compressed around the projectile, substantially as and for the purposes set forth.

And in combination with an expanding case, jacket, or band, applied to a projectile, I claim the use of an outer covering of wire cloth to constitute a packing, substantially as and for the purpose specified.

26,338.—Wm. Cogswell and Ira Cogswell, Jr., of Ottawa, Ill., for an Improvement in Harvesters:

We claim the combination of the shifting pinion, I, with the eccentric axle, D, and adjusting frame, E, substantially as shown, so that by turning the said axle, the pinion, I, will be thrown into gear with either of the concentric wheels, C H, or out of gear with both as desired, and so that the hight of the main frame may be readily adjusted to correspond with the adjustment given the axle, D, and pinion, I, as set forth.

[This invention relates to a novel arrangement of the sickle-driving device, whereby the speed of the sickle may be raised, and the latter adapted for cutting either grass or grain on one and the same machine, the invention also admitting of the ready adjustment of the sickle, so as to cut the necessary hight to suit the crop to be harvested.]

26,339.—J. P. Collins, of Troy, N. Y., for an Improved Water-wheel:

I claim, first, The arrangement of the lighter plate, L, in the particular manner specified and for the purpose set forth.

Second, The arrangement in the particular manner specified of the packing ring, i, for the purpose set forth,

Third, The arrangement, in the particular manner specified, of the lip or projecting piece, e, of the buckets, for the purpose set forth.

Fourth, The arrangement in the particular manner specified, of the regulating plate, J, in combination with the peculiar specified device for operating it, for the purpose set forth.

Fifth, The employment or use of the dividing strip, or annular ring inserted in the buckets, substantially as and for the purpose set forth.

Sixth, The employment for united use, in one wheel of the lighter plate, B, packing ring, i, projecting lips, or flanches, e, gage or regulating plate, J, and annular dividing plate, A, the whole being constructed, arranged and operating in the manner and for the purpose set forth.

26,340.—John Cooper, of Mount Vernon, Ohio, for an Improvement in Boxes of Vertical Sugar Mills:

I claim the concentric cups, H and I, upon the upper sides of the heads, C C′, the same being furnished with the openings, e and o, for the conveyance of the oil from the upper box to the stationary cup, J, which surrounds the shaft upon the lower bed plate, K in combination with the cups, J, substantially as described for the purpose set forth.

26,341.—T. P. Costello, of Buffalo, N. Y., for an Improvement in Skate Fastenings:

I claim a boot, with sockets, therein as described, and upright bolts welded to a steel blade, or skate runner, both being made and arranged as shown and described, and attached to each other, for the purpose specified.

26,342.—E. G. Cushing, of Dryden, N. Y., for an Improvement in Horizontal Water-wheels:

I claim the combination of the tubes, b, with the bolts, c, and buckets, D, the whole being constructed and arranged as and for the purpose shown and described.

[This invention relates to an improvement in horizontal centervent wheels, and consists in having the buckets attached or applied to the wheel in a novel way, whereby the buckets may be readily adjusted so as to increase or contract the issues, and regulate the discharge of water according to the supply, or as may be desired, and also permit a bucket in case of injury to be removed with facility, and replaced by a new one.]

26,343.—G. W. R. Bayley, of Brashear, La., for an Improvement in Hook-headed Spikes:

I claim the improved railroad spike, having the sides and front of its head beveled downwards and inwards, but convex, and having the peculiar projecting lip or hook behind, for facilitating its easy withdrawal, as a new article of manufacture.

26,344.—C. G. Burke, of Utica, N. Y., for an Improvement in Melodeons:

I claim fitting a melodeon or other reed instrument of the same class, with a series of swell valves, D, so applied as to be capable of being operated by the keys, in playing, substantially as described. for the purpose of giving expression to any note, independently of the preceding or succeeding ones or of the other notes of a chord.

And I also claim the employment of a stop, H, applied and operating substantially as described, in combination with the keys, and the swell valves, for the purpose set forth.

26,345.—Jacob Dickerson, of Sacramento, Cal., for an Improvement in Wind Mills:

I claim the arrangement of the curved iron sections, E′, sails, B, arms, D, slides, E, hollow drum, I, scroll spring, H, flexible connecting rods, J, and links, G, in the manner and for the purpose described.

[This invention consists in so arranging the sails of the windwheel that, if the wheel increases in its velocity to such an extent as to endanger the mill, they will turn in and present less surface to the wind current, and thus counteract the speed. The turning-in of the sails is effected by having them hung on pivots, connected at different points by straps, and combined with centrifugal slides, which latter are controlled, so long as a proper speed is maintained, by means of a scroll spring. This is a very simple and ingenious arrangement, and we think it will operate well.]

26,346.—C. W. Dickinson, of Newark, N. J., for an Improvement in Sewing Machines:

I claim the construction of a pendently swinging, gravitating self-adjusting pressure pad, or stripper, X X, formed with an adjustable slotted end, X2, suspended on an adjusting pin or stud, B3, the said pad having no feed pressure spring, but substantially as described, set forth and shown.

26,347.—Jeptha Dyson, of Fulton, S. C., for an Improvement in Carding Engines:

I claim, first, The combination and arrangement of the feed regulating and working cylinder, a, feeder, A, worker, c, and clearer, b, substantially in the manner and for the purpose described.

Second, The combination and arrangement of the feeder, A, worker, B, cleaning and delivering cylinder, C, and main cylinder, D, substantially as and for the purpose described,

Third, The combination, and arrangement of the feed regulating and working cylinder, a, feeder, A, worker, c, clearer, b, worker, B, clearing and delivering cylinder, C, and main cylinder, D, substantially in the manner and for the purpose set footh.

Fourth, The combination, with the features included in the third claim of the stripper, E, substantially in the manner and for the purposes set forth.

26,348.—A. B. Furbee, of Dresden, Ohio, for an Improvement in Corn Cribs:

I claim the arrangement of the inclined flooring, C, with the trunks or boxes, D, substantially as and for the purpose set forth.

I also claim covering the posts, A, of the crib, with sheet metal, d, when said posts are used in connection with a crib provided with an inclined flooring, C, and trunks or boxes, D, as and for the purpose specified.

[The object of this invention is to obtain a crib that cannot be entered by rats, mice, and like vermin, and also one from which the corn can be taken as desired for use with the greatest facility.]

26,349.—Jackson Gorham, of Bairdstown, Ga., for an Improvement in Plows:

I claim the arrangement of the vertical curved standard, B, shovel C, curved handle straps, D, hooked inclined brace, E, and adjustable brace, E, and adjustable beam, A, as shown and described,

[This invention consists in a peculiar manner of constructing the plow, whereby a strong, light, durable, and economical plow is obtained.]

26,350.—Caleb H. Griffin, of Lynn, Mass. (assignor, through mediate assignment, to Walter D. Richards, of same place), for an Improvement in Machinery for Cutting Leather into Soles for Boots and Shoes. Ante-dated June 6, 1859:

I claim, first, Vibrating the knife or knives, L, in the arc of a circle or a curve approximating thereto, in the manner substantially as set forth.

Secondly, I claim the arm. M, stud, n, and slot, N, or their equivalents, as combined with the knife or knives, L, for the purpose substantially as described.

26,351.—Daniel M. Hall, of Bridgeport, Conn., for an Improvement in Railroad Car Blinds:

I claim the use of the flexible blind, C, arranged with the rollers, l l, fitted within the curved grooves, e e, and applied to the window of a car, or other wheel vehicle, so that it may be raised above the sash, B, and drawn within the roof of the vehicle substantially as described.

[This invention consists in having the blind so constructed that it will be flexible, and be permitted to work or rise and fall in a carved groove, whereby the blind may be drawn into the roof of the car or other vehicle, for the purpose of raising it within a comparatively limited space, and the blind applied to the window without at all interfering with the operations of the sash.]

26,352.—Alexander Hay, of Philadelphia, Pa., for an Improvement in the Bearings of Railroad and other Machinery:

I claim imbedding the bearings of journals or surrounding the same with india-rubber, or other suitable elastic material, so as to cause them to yield in every direction when subjected to strains and thrusts, and re-adjust themselves upon the pressure being removed, substantially as described.

26,353.—George G. Henry, of Mobile, Ala., for an Improvement in Drying Wet Seed-cotton:

I claim the application of artificial heat for the purpose of drying wet seed-cotton, by means of mechanism, substantially as described.

26,354.—John Herald and C. B. Tompkins, of Trumansburg, N. Y., for an Improvement in Pitchforks:

We claim the arrangement of the hollow head, A, tines, B, passing through the head socket, b, handle, C, screw, D, plugs, c, and screw tangs, d, as and for the purpose shown and described.

[The invention consists in constructing the head in T form, of cast metal, and hollow; the teeth being secured in the head, and the head secured to the handle, whereby the desired object, and consequently, an improved article of manufacture, is obtained.]

26,355.—F. E. Hinckley, of Galesburgh, Ill., for an Improvement in Mole Plows:

I claim, first, The combination of the clearer or hanging coulter, F, and the rotating coulter, G, constructed and arranged as described, for conjoint operation.

Second, I claim constructing the sword, M, of a mole plow, with a hole or bore, N, through it, of sufficient size and suitable shape to admit at the same time a rod of metal large enough to raise and lower the point of the mole, and also to admit the air to pass free into the drain through the sword and mole, as described.

Third, I claim expanding and contracting the mole of a mole plow, substantially as and for the purpose described, or by any other mechanical means.

Fourth, I claim constructing the mole of a mole plow in sections consisting of two sides and a top, hinged to a head block and operated by a wedge, as described.

Fifth, I claim two revolving cutters, with plain outsides and conoidal insides, which may be placed upon a common axle and adjusted to the beam in such a manner as to be forced to cut into the ground, and press the earth laterally into the sword cut and firmly close it up, substantially as described.

26,356.—Truman J. Homer, of St. Louis, Mo., for a Portable Collection Box:

I claim the whole box as original, as a portable collection box, in the peculiar arrangement of its component parts of glass, wood and metal.

I particularly claim the money inlet as original, it being in the shape of a box without a bottom, through the top of which is inserted a narrow flat tube, and between it and the sides of the box are two ranges of disks, which disks close the aperture of the tube when the box is inverted.

26,357.—Sheldon A. Hotchkiss, of New Haven, Conn., for an Improvement in Machines for Raising Weights:

I claim the zone, J, and the screw drum, pawl hook, knee and and sheeve, in combination, substantially as and for the purposes set forth.

26,358.—E. E. Marcy, of New York City, for an Improvement in India-rubber Fabrics:

I claim the improved india-rubber fabric made by the combination of india-rubber with hypo-sulphite of zinc, and by the exposure of the said compound to steam or water at the temperature stated, substantially as described, without any admixture of free sulphur.

26,359.—E. E. Marcy, of New York City, for an Improvement in India-rubber Fabrics:

I claim the improved india-rubber fabric made by the combination of india-rubber with sulphuret of lead and carbonate of lead, or the protoxyd of lead, and by the exposure of said compound to steam or water at the temperature stated, substantially as described, without any admixture of free sulphur.

26,360.—E. E. Marcy, of New York City, for an Improvement in India-rubber Fabrics:

I claim the improved india-rubber fabric made by the combination of india-rubber with the sulphuret of zinc and hypo-sulphite of zinc, and by the exposure of said compound to steam or water at the temperature stated, substantially as described, without any admixture of free sulphur.

26,361.—Emanuel Marquis, of Bloomington, Ind., for an Apparatus for Setting and Copying Music for the Blind:

I claim the tablet, A, or its equivalent, with raised staves and sockets, in combination with detached solid notes and other signs of musical notation, or their equivalents, capable of being transposed on and fixed in the table, substantially as and for the purpose described.

26,362.—Samuel W. Marsh, of Washington, D. C., for an Improvement in Breech-loading Fire-arms:

I claim the construction and application of a detachable-headed breech pin, h h I J K (Fig. 6), with a split female expanding ring or collar, L (Fig. 7), and a non-expanding male collar or ring, M (Fig. 8), and a detachable adjusting screw head, O (Fig. 9), forming a compound, expanding detachable-headed breech pin, as shown complete at h h L O (Fig. 4), substantially as described and set forth.

26,363.—Edwin May, of Indianapolis, Ind., for an Apparatus for Sanding Painted Surfaces:

I claim the combination and arrangement of the blast fan, F, in cylinder, A, conductor, B, adjustable mouth-piece, D, with the elastic tube, N, or its equivalent, when constructed and arranged substantially as set forth.

26,364.—Edward Maynard, of Washington, D. C., for an Improvement in Breech-loading Fire-arms:

I claim, first, The peculiar manner of connecting the barrel to the breech-piece, viz.: the hook, e, on the underside of the barrel, taking hold of the pin, f, or the equivalent thereof, at the front end of the breech-piece, while the link, C, the lever, D, and the joint pins of said link and lever are arranged in such a manner, with relation to the slot in the breech piece and the ears on the underside of the butt of the barrel, as to form a treble-jointed and compound leverage connection between the breech-piece and the butt of the barrel, of such a character that the barrel can be instantly thrown from a firing position to a loading position, and vice versa; and also of such character that the barrel can be easily and quickly detached from the breech-piece or be securely united thereto, substantially in the manner set forth.

Second, I also claim the combination of the metallic block, b, the screw, c, and the screw, a, with each other and with the front portion

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of the breech-piece, and in such a manner, with relation to the shoulder, d, on the underside of the barrel, that the joint between the butt of the barrel and the abutment of the breech-piece can be tightened or loosened, substantially in the manner set forth.

Third, I also claim retaining the pivot pin, w, in its position within the breech-piece by means of the overlapping head of the screw, a'; but this I only claim when the longitudinal groove, z, in one side of a portion of the length of said pivot pin, is so located that when the pin is turned to the position shown in Fig. 12, or any other previously-determined position, it may be drawn out far enough (and only far enough) to detach the said pin from its hold upon the lever, D, and thereby allow the barrel to be separated from the breech-piece, substantially in the manner set forth.

Fourth, When the pivot pin, w, is retained in its position withiu the breech-piece by the overlapping head of the screw, a', in such a manner that it can be loosened by partially turning the same upon its axis, I also claim the arm, b', upon the outer end of said pin which enables it to be readily turned upon its axis, and partially withdrawn from its place without any mechanical assistance, substantially as set forth.

Fifth, When the barrel is connected to the breech-piece in the within-described manner, I also claim the producing of a tight joint between the butt of the barrel and the abutment of the breech-piece by combining therewith a flange-bottomed metallic cup, substantially as set forth.

Sixth, I also claim giving the opposite faces, r r, of the butt of the barrel such a shape that the flange-bottomed metallic cup, v, can be easily taken hold of by the thumb and finger of the free hand of the user, when the barrel is thrown into the loading position, substantially as set forth.

26,365.—G. W. Mitchell, of Jackson, Tenn., for an Improvement in the Mode of Operating Car Brakes:

I claim the flanged or ratchet wheel and its hooked pawl, as described and shown in Fig. 2, at F G.

I also claim the spring platform and the pin attached, and stop-pin, I (Fig. 2), as described and for the purpose set forth.

26,366.—G. W. Mitchell, of Jackson, Tenn., for an Improvement in Sewing-machines:

I claim, first, The combination of the crank, I, on the driving-shaft, the slotted arm, H, forming a portion of the same lever with the needle arm, and so extended as to operate the lever, F', and the lever, E', carrying the shuttle or looper; the whole arranged and operating, substantially as described, to drive the needle and shuttle.

Second, The vertically and horizontally elastic arm, L, having the presser attached, and constructed and applied substantially as described, so as to be operated upon by an appendage of the needle to feed the material substantially as set forth.

Third, The polygonal collar, M, fitted to turn upon the needle arm, so that any one of its sides may be presented to act upon the presser arm for the purpose of feeding the cloth more or less, according to the wish of the operator, as set forth.

26,367.—Richard Montgomery, of New York City, for an Improvement in Iron Ships:

I claim, first, Forming the supports or frame to which the side covering, E, is attached, of iron or other metal corrugated, in the form and for the purposes substantially as described.

Second, I claim the combination and arrangement of the corrugated cross-beams, B, and corrugated bottom supports, A, with the iron divisions, D, substantially as and for the purpose set forth.

26,368.—Oscar F. Morrill, of Boston, Mass., for an Improvement in Broiling Apparatus:

I claim the improved steak broiler, as made with the deflector in its grid or grating, a flame and heat passage under the deflector, and, with the gravy trough, to surround or encompass the heat passage, as specified.

26,369.—John Knickerbocker, of Stockport, N. Y., for an Improvement in the Clutch for Pulley Coupling:

I claim suspending the clutches or impellers, A A A, in radial slots in the disk of the movable pulley, E, so as to allow them to vibrate, substantially in the manner and for the purpose set forth.

26,370.—N. W. Langley, of East Cambridge, Mass., and Henry Jones and A. S. Drake, of Stoughton, Mass., for an Improved Mode of Securing Photographs, &c., to Tombstones:

We claim securing daguerreotypes, photographs, &c., upon tombstones, by inclosing them in a glass case, the opening to which is closed by a glass stopper, and affixing the same to the stone.

26,371.—Thomas J. Linton, of Providence, R. I., for an Improvement in Mounting Precious Stones, &c.:

I claim the improvement in making mountings for precious stones and other articles of jewelry, which are to be mounted by forming the border setting and beveled edge from a single sheet of metal, at one operation, by the use of a die, in the manner described, the mountings being in an oval, round, square, or other form, as the article to be mounted may require.

26,372.—Charles A. Lowber, of Medina, N. Y., for an Improvement in Cotton Seed-hullers:

I claim making the runner with the surface next to the shaft smooth, to receive the cotton seed from a suitable hopper and cause them to be properly distributed thereon and to be carried towards the periphery, and with that part of the surface within the periphery, and outside of the smooth part armed with teeth in the form of long cutting edges, having continuous channels or furrows between them of sufficient size to receive a cotton seed and permit it to pass and roll therein, substantially as described, in combination with an upper plate surrounding the eye or aperture for the passage of the cotton seed to the smooth part of the surface of the runner, the under surface of the said plate being parallel with the surface of the runner, and armed with a ring of teeth in the form of long cutting edges, and formed with interposed channels or furrows similar to those of the runner but of reversed inclination, substantially as and for the purpose specified.

I also claim making the said teeth of long cutting edges, and surrounding the smooth surface of the runner of varying lengths, as described, that is, having some of them approaching the shaft nearer than others, that the seeds, while traveling outward on the smooth surface of the runner, may arrange themselves and properly enter the furrows or channels one by one, as described.

And I also claim surrounding the periphery of the runner and upper plate with a trough which extends within the periphery of the runner, leaving an open space or air passage between, substantially as described, in combination with the vanes, or equivalent means, for blowing in a current of air, substantially as and for the purposes specified.

26,373.—Washington A. Peaslee and John O. D. Lilly, of Indianapolis, Ind., for an Improvement in Spark-arresters and Chimneys of Locomotive Engines:

We claim the construction of a chimney or spark-arrester by the combination and arrangement of the various parts, substantially as they are described in the foregoing specification and for the purposes mentioned.

26,374.—Nathan Pucket, of Deming, Ind., for an Improved Boiler-feeding Apparatus:

I claim the arrangement of the chamber, D, valve, E, chest, A, and openings, B C, as and for the purpose shown and described.

[This invention consists in attaching a rectangular valve chest or chamber to the boiler, which communicates with the same through an aperture above the low water line, and with a feed-pipe extending to a heater in which the water is heated to a boiling point, through an aperture above the high water line, and providing said valve chest or chamber with a reciprocating valve, containing a chamber which shall alternately communicate with the openings leading to the feed-pipe and boiler, and receive from the former a full supply of water heated to a boiling point, which, when conveyed below and made to communicate with the water in the boiler, will evolve steam and discharge itself into the boiler until an equilibrium is established with the water in the same, thus producing a self-regulating feeder.]

26,375.—Samuel M. Richardson, of New York City, for an Improvement in Hinges:

I claim constructing hinges for blinds by the bent straps, f g, passing around the outer edges of the blind, and enclosing the angle thereof, combined with the eye, d, connected to said bent strap, f g, by the part, e, the whole applied and acting in the manner and for the purpose specified.

26,376.—D. Sanford, of Taylor, Ill., for an Improvement in Harvesters:

I claim, first, The sliding rake bar, E, fitted within the bent arm, D, and provided with a jointed rake head, F, in connection with the guide strip, m, and a gavel passage, n, on the platform, A, substantially as described.

Second, The combination of the tilting gavel-receiver, H, with the tilting-box, J, when arranged to operate together, automatically as and for the purpose set forth.

[This invention consists in a novel arrangement of a rake and grain or gavel passage and also in a tilting gavel-receiver and a box, whereby the grain, as it is cut, is raked into gavels and into the receiver in which they are bound by the attendant, and thrown by him into a box which is tilted intermittingly, so as to cast the sheaves in bundles on the ground.]

26,377.—Henry Bohrer, of Strasburg township, Lancaster county, Pa., for an Improved Churn:

I claim the application of the tube, I K, to enter the rear head of the churn, the connecting pipes, C and H, and its wide mouth, m, partition, l, and connecting tubes, L M, with the dashers, D, elevated on an open step, F, when combined in the manner and for the purpose specified.

26,378.—Wm. Selpho and James Walber, of New York City, for an Improvement in Artificial Hands:

We claim, first, The arrangement of the cords or catguts, m and o, and the pulley, n, as set forth, for applying a double purchase in opening the hand, as described and shown.

Second, We claim the arrangement of the wrist joint and hand spring, l, whereby the said spring, l, can be adjusted by the rod, k, that passes through the pipe, h, in the manner specified.

Third, We claim the cord, p, or its equivalent, passing from the elbow-pad, r, and giving motion at the wrist, g, for the purposes and as specified.

26,379.—Isaac C. Shuler, of Amsterdam, N. Y., for an Improvement in Sheet Metal Coffins:

I claim, first, The arrangement of stiffening the base of a sheet metal coffin by locking together the surplus edges of the walls and bottom, forming a rim, c, surrounding the base, also the frame, D.

Second, The inside tray, E, whose bottom is in permanent contact with the exterior bottom, S, and whose sides may be soldered directly to the walls, A, or set away, leaving a chamber to be filled with molten metal, as described.

Third, The arrangement of scrolling or double locking the walls at the corners, in order, by making a voluminous joint, to stiffen and brace the general structure, whether the body of the joint be formed on the inner or outside of the coffin.

Fourth, I claim the slotted or double rim, H I, through which the the walls protrude, as described, for the purpose of stiffening the upper edges of the walls, and sustaining the lid or cover; also, the arrangement of folding the surplus edges of the walls over the frame, I, for the purpose specified.

Fifth, I claim stiffening the cover, J, with the frame, r, near its outer edge on the upper side, enclosing the surplus sheet metal over the same.

Sixth, I claim, for the purposes of stiffening their respective portions of the coffin, the frames of cast or wrought metal, P, for the blind, B K, for the cover, J G and F, for the walls in the vicinity of the handles, to for the upper edge of the tray, E and q, for the exterior bottom, S.

Seventh, I disclaim hinging the sections of the concave sides of the cover to the body of the same, but—

I claim hinging them to the body of the coffin.

26,380.—J. C. Stoddard, of Worcester, Mass., for an Improvement in Hay-making Machines:

I claim, first, The rake head shaft, furnished with friction wheels or rollers, which are arranged on pivoted lever bearings, in combination with driving wheels which are furnished with a plain flange for the friction rollers to act against, so that the necessary friction may be produced either by means of the specified lever arrangement or by the same in combination with the gravity of the rake head, substantially as and for the purpose set forth.

Second, I claim the adjustable spurred ring, P, set screws, p p, with the wheels, u, on the ends of the rake bars, N, arranged and combined as set forth and for the purposes specified.

26,381.—Samuel Tasver, of White county, Ark., for an Improvement in Saw-mills:

I claim, first, The arrangement of the parts, A B C D E H I J K L, of Fig. 1; I say arrangement, because I cannot claim the invention of pulleys, saws, rollers, shafts, &c., these being in use everywhere, but simply claim the peculiar manner in which they are arranged.

Second, I claim the construction of the saw carriage, as described above and by drawing of Fig. 3.

26,382.—Thomas Thorpe, of New York City, for an Improved Machine for Making Cigars:

I claim, first, The arrangement of the drums or pulleys, A B, in connection with the rollers, M, and belt, C, with or without the rollers, N, substantially as and for the purpose set forth.

Second, I claim, in connection with the above, the runged wheel, D, or its equivalent, arranged and operated in the manner and for the purposes set forth.

Third, I claim the means, substantially as described, of regulating the pressure on the cigar.

Fourth, I also claim, as my invention, the arrangement of a machine substantially as set forth, as an arrangement not heretofore known, for the purpose before mentioned.

Fifth, I also claim the peculiar steady curves or bends given to the belt, C, for the purposes mentioned.

26,383.—J. P. Tice, of Baltimore, Md., for an Improved Rotary Cutter-head:

I claim the employment or use of a cylinder, C, or any segment or section thereof, applied to rotary cutters, to operate substantially as and for the purpose set forth.

26,384.—Geo. W. Tolhurst, of Liverpool, Ohio, for an Improved Washing-machine:

I claim constructing the round follower of washing-machines of two sets of rings or hoops, and furnishing each set of rings with a handle, so that the surface that comes in contact with the clothes can move in opposite directions at one time; and this I claim when the same is arranged for operation, in the manner and for the purpose as described and set forth and for the purpose specified.

26,385.—A. P. Torrence, of Oxford, Ga., for an Improved Machine for Girdling and Felling Trees:

I claim the employment or use of the handle, B, provided with a cutter, A, and connected to a draught lever, G, by the bars, C D E, or any equivalent means, so as to operate substantially as and for the purpose set forth.

[This invention consists in attaching a cutter to a proper handle and connecting said cutter and handle to a draught lever in such a way that, where the implement is applied to its work, the necessary power applied to the draught lever and the cutter handle properly manipulated by the operator, the cutter will be moved around the tree and cut the same circumferentially and towards its center.]

26,386.—Hiram Van Dusen, of Phelps, N. Y., assignor to himself and H. Rockfellow, of Clifton Springs, N. Y., for an Improved Clapboard Gage:

I claim a gage for fitting clapboards for railing, composed of the bar, A, the arm, B, the slide, D, with the cam and lever by which it is actuated, the stop, H, and the straight edge, k, or their equivalents, constructed and arranged substantially as set forth.

26,387.—Theodore Van Deventer, of New Brunswick, N. J., for an Improvement in Rollers for Printing Paper Hangings:

I claim the combination of the conically bored and grooved bushes, B, the concentric feathered collars, D D, the feathered and screwed shaft, U, and the nuts, E E, the whole applied and operating as described.

26,388.—Nahum Washburn, of Bridgewater, Mass., for an Improvement in Dental Apparatus for Relief of Pain while operating:

I claim the combination of dental forceps, or instrument for operating upon teeth, with electro-magnetic mechanism, substantially as described, or its equivalent, so that the electrical current or currents may be made to flow through the nerve or nerves of the tooth, or the jaw or flesh immediately contiguous thereto, in order to benumb the same and render such more or less insensible to pain during the performance of the dental operation.

I also particularly claim the application of the electrical apparatus to the dental instrument, so that the latter may be in or form part of the circuit as specified.

26,389.—D. A. Willbanks, of Harmony Grove, Ga., for an Improvement in Threshing-machines:

I claim the peculiar construction of the wrought-iron ribs, I, in combination with the peculiar construction and arrangement of the cylinder heads, H, to wit, the ribs with angular hooks, e e, and the cylinder heads with key seats, and with the slotted projections, c c, and radial slots, d, as and for the purpose set forth.

[This invention consists in an improvement in the construction of the beater cylinder, whereby the same is rendered extremely durable and easy of construction. The invention also consists in the employment or use of a dust guard applied to the machine to protect the operator from the dust that is discharged from the machine.]

25,390.—Wm. F. Yeager, of Starkville, Miss., for an Improvement in Plows:

I claim the arrangement of the landside, G, the shank, S, slot, P, brace, T, lug, U, beam, F, brace, X, handles, E D, share, A, cutter, K, and mold board, B; the whole being constructed as described, for the purposes set forth.

26, 391.—George W. Atkins, of Milton, Del., and Wm. B. Aitkens, of Philadelphia, Pa. (assignors to G. W. Atkins and J. B. Henry, of Delaware City, Del.), for an Improvement in Registering Machines:

We claim, first, Making the ratchet wheels, C C', in pairs secured together with their notches inclined in opposite directions, as described, in combination with both an actuating and a checking pawl, operating together simultaneously, as described; the same being constructed and arranged together substantially in the manner and for the purpose set forth and described.

Second, We claim the employment of a self-righting cover, G G', operating in combination with the platform, A, or its equivalent, substantially in the manner and for the purposes set forth and described, and this we claim whether the said cover, G G', be applied either to a fixed platform or floor, A, or to the moving platform of a weighing-scale, connected with a registering machine, as described.

Third, We also claim the bell-striker, F, when the same is constructed with the arms, 5 6 7, and operated by the notches of the ratchet wheel, C, as and for the purpose set forth and described.

26, 392.—Charles H. Dennison, of Guilford, Vt. (assignor to A. Miller, of Brattleboro, Vt.), for an Improved Tool for Finishing Felloes:

I claim, first, The described washer and the described iron gage for trimming and shaping the internal surface of felloes, &c.

Second, The described collar gages for squaring the external and internal curved surfaces of the felloe.

26, 393.—Wm. B. Dunbar, of Waterbury, Conn. (assignor to himself and Geo. H. Seymour, of Plymouth, Conn.), for an Improved Ladle and Fork:

I claim the combined ladle and fork constructed in the manner described and represented, for the purposes set forth, as a new article of manufacture.

[This invention will be undertood by the claim. Its object is to facilitate the removal of vegetables, such as potatoes, turnips, beets, &c., from the boiler or pot, after they have gone through the process of boiling and are to be immediately removed therefrom, while the water is in a boiling state.]

26, 394.—Thos. Ellis (assignor to himself, W. A. Ellis, and A. D. Ellis), of Philadelphia, Pa., for an Improvement in Casting Boxes for Wheel Hubs:

I claim supporting the sand core, E, between two sand heads, F, when the above parts are employed in connection with a sand mold, C, in the manner shown and represented.

[The object of this invention is to cast the boxes with internal diameters of uniform size, by obviating the difficulty hitherto attending the varying position of the core relatively with the other parts forming the mold, the change of position of the core within the mold a each casting very appreciably affecting the dimensions of the interior of the boxes, as is well known.]

26, 395.—Richard Fitzgerald (assignor to James Booth), of Newark, N. J., for an Improvement in Machines for Forming Hat Bodies:

I claim, first, Distributing the fur, C, on the former, L, by discharging the same through an annular opening, b', over and co-centric with the former, L, substantially as set forth.

Second, The employment or use of the stationary shell, O, provided with the recess, p, cards or pickers, q r, and having within it the co-centric rotary wheels, P Q, one or more, also provided with cards or pickers, v u, and with or without fan blades, w, when said parts are arranged relatively with the former, L, to operate substantially as described.

Third, The employment or use of the slide, G, with the sliding tube or pipe, H, fitted therein, containing the former shaft, J, the box, F, and elastic belt, l, or its equivalent; the above parts being arranged relatively with the suction fan, C, and the shell, O, and wheels, P Q, substantially as and for the purpose specified.

26,396.—George N. Hall, of Mamakating, N. Y., assignor to himself and S. Arthur and J. Pierce, of said Mamakating, and D. S. Arthur, of New York City, for an Improvement in Horse Hay Rakes:

I claim the arrangement of the main lever, H, intermediate link, h, auxiliary lever, e, connecting-rod, d, cam, k, arm, c, rake head, G, b, and slotted brace bar, F, and driver's seat, D, substantially as and for the purposes set forth.

[This invention consists in arranging the driver's seat and the rake head in such relation to each other that the driver can counterbalance the weight of the rake head and of the grass taken up by the same; and the rake head is attached to a series of levers which are arranged in such a manner that the rake head can be turned over from the driver's seat, so as to discharge its contents, or so that the rake can be depressed and made to follow the uneven surface of the ground.]

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26,397.—James W. McLean (assignor to himself and Edwin May), of Indianapolis, Ind., for an Improvement in Steam Plows:

I claim the arrangement of the plows, h, gearing, V W X, cutters, b, lever, T, and connecting-rod, S, in combination with the universal jointed shaft, U M M, when operated in connection with the steam-engine, substantially as set forth.

26,398.—John P. Kemp, of Charlestown, Mass. (assignor to N. F. Stevens, of Moultonboro', N. H.), for an Improvement in Peg Tubes and Drivers:

I claim constructing the interior peg-guiding portion of the tube of a form made up of angles or corners and surfaces, substantially as described, and so that, while the cross section or area thereof is materially greater than that of the peg, to admit of a driver of increased strength and materially greater cross section or area than that of the peg working therein, said tube in its peg-guiding portion serves by its corners or angles and surfaces to restrain the peg from lateral shake or play.

26,399.—Warren Nichols, of Lima, Ohio (assignor to himself and Thomas Ghormley, of Stokes, Ohio), for an Improvement in Cattle Pumps:

I claim the combination with the covers, L L', of stops which will open the trough when its corresponding platform rises to its highest position and close it when the platform descends to its lowest position, as described, for the purposes set forth.

Second, The arrangement described of the spout, I, in combination with the arm, k, or with some other part operated by the descent of one of the platforms, by which the direction of the water is changed, near the close of the descent of the platform, as set forth, for the purpose stated.

26,400.—George H. Reynolds (assignor to Caleb Barstow and D. D. Badger), of New York City, for an Improvement in Cut-off Valves of Steam-engines:

I claim the arrangement within each steam-chest of a rotary engine of the starting and reversing valve having the cut-off valve in combination therewith, the two being so coupled and operating that the starting or reversing may be effected without coupling or uncoupling any of the connecting parts, substantially in the manner set forth.

26,401.—Nancy P. Brashear, of the parish of St. Mary, La. (executrix of Robt. B. Brashear, deceased, late of Pattersonville, La.), for an Improved Mode of Applying Sulphurous Acid Gas in the Defecation of Cane Juice:

I claim subjecting sugar cane juice or other saccharine liquid to the direct action of the fumes of burning sulphur, such liquid being employed in a diffused state, as set forth, so that every or nearly every portion of the whole body of liquid is brought in contact with the same almost simultaneously, substantially as and for the purpose set forth.

26,402.—Rebecca H. Willson (Administratrix of the Estate of John M. Willson, deceased), of Washington, D. C., for an Improvement in Fastening for Cartridge Boxes:

I claim a cartridge-box fastening composed of hinged lever and spring, said spring serving to hold the lever open or closed, and said lever by the aid of said spring, clamping the flap of the cartridge-box between itself and the side of said box, substantially as herein represented.

RE-ISSUE.

William Butcher and William A. Butcher, of Philadelphia, Pa., for an Improvement in Coating Metallic Surfaces. Patented June 29, 1858:

We claim the combined process, substantially as described, of coating metals with the compositition made of india-rubber or allied gum, dissolved in and combined with linseed oil, in a heated state, in proportions substantially such as set forth, by first heating the metal to be coated to about 350°, applying the composition to the metal surface while so heated, and then subjecting the metal so coated to about 200° of heat, substantially as described.

EXTENSIONS.

Thomas D. Burrall, of Geneva, N. Y., for an Improvement in Corn-shellers. Patented Dec. 6, 1845:

I claim making the concave plate or disk with a concave face and circular opening provided with a lower and upper lip for the discharge of the cobs, in combination with the sheller and with the sheller bottom and also with the door or valve in the side for broken cobs &c., and also the cylindrical hopper and spring, in combination with the feeder; all as described.

James Hamilton, of New York City, for an Improvement in Dredging Machines. Dated March 30, 1852. Antedated Dec. 16, 1845:

I claim the shovels or scoops, h, forming the bottom of the compartment in a proper frame, and moving at one end on a hinge or similar contrivance, the other end being lowered to cause the scoop, as the frame is moved along, to collect the sand or mud or other material operated on, and retain the same by suitable mechanical means operating to lift the scoop and close the bottom, as described and shown.

NOTE.—Nearly one-half of all the patents issued this week were secured through the Scientific American Patent Agency. The entire number in the foregoing list is seventy-two; THIRTY of this number were cases which were prepared at this office.

Literary Notices.

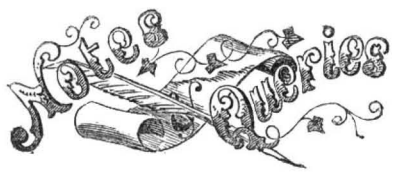
THE ATLANTIC MONTHLY.—The two leading serials, "The Minister's Wooing" and the "Professor at the Breakfast Table," are completed in the December number of this magazine; Dr. Holmes' wonderful fertility of mind sustains him fully to the close of the second year. Holmes resembles Charles Lamb more nearly than he does any other writer; his humor may not possess the volume and abundance of that of Lamb, but it has the same delicate subtlety, and it is combined with a depth and breadth of thought which Lamb never manifested, and with that peculiar clearness of intellect which comes from the study and investigation of physical science.

THE LONDON QUARTERLY REVIEW.—We have received the October number of this magazine. The only article belonging to the department of science is the one on "Farm Weeds." Persons interested in agriculture will find it full of valuable facts. The review of Professor Powell's "Order of Nature" is marked by that extraordinary ability which characterizes the four English reviews, which are reprinted by Leonard Scott & Co.

THE BUILDER—An artistically illustrated and ably edited journal published in London, has been sent to us through the agent in this country, John Wiley, No. 56 Walker-street, this city. It contains splendid engravings of Prince Napoleon's private residence at Paris, a design for a theater in Rio de Janeiro, the new Westminster Bridge, and the Chartres Cathedral in France.

THE PRACTICAL MECHANICS' JOURNAL—Another valuable periodical emanating from London (J. Wiley, agent, New York)—contains several illustrations of mechanical subjects, and much interesting matter. But it appropriates, from the SCIENTIFIC AMERICAN, an article on the Brazilian Law of Patents, without credit; we presume this is an oversight. "Life-illustrated," a journal published in this city, also copies this law, which was furnished by our correspondent at Rio de Janeiro, and credits it to the "Mechanics' Journal." This is not fair, but we doubt not the amende honorable will be made. We would also remind the "American Presbyterian," published in Philadelphia, that the article in its recent issue, entitled "Coral Formations," was taken from the SCIENTIFIC AMERICAN, and should have been credited. We have seldom to complain of such treatment from our cotemporaries.

MESSRS. RUDD & CARLETON, No. 130 Grand-street, this city, although comparatively a new publishing firm, have been exceedingly industrious in their operations, and vie with some of the older firms in the number and character of their new books. Among the latest works received from them, we have to mention "The Great Tribulation," a characteristic work from the prolific pen of the versatile Rev. Dr. John Cumming, pastor of the Scotch church, Drury Lane, London, a preacher well known to our people. This work has provoked a vast deal of criticism, and those who are fond of something original in theological speculation will find this work full of interest. For Christmas reading, they have published, in beautiful style, "Mother Goose, for Grown Folks." It is a capital thing, and will interest many a grown-up juvenile, who, in days of yore, took delight in "Banbury Cross," "Little Boy Blue," "Jack Horner," "The Woman who lived under the Hill," "Baa, Baa, Black Sheep!" &c. Many of us who were once young, and now feel old, may in part renew our age by such Christmas reading.



J. H., of Mass.—We advise you to keep a careful record of your experiments. This you can do by writing them down and making sketches as you progress, and getting parties to witness these papers, or you could swear to them before a justice of the peace. Many inventors are very careless about such matters, and when they find their application opposed and the question of priority of invention raised before the Patent Office, begin to realize the value of clear proofs. We caution all inventors to be more careful on this point.

C. McK., of N. Y.—Red lead is employed as one of the ingredients in the composition of friction matches for supplying oxygen to assist combustion. It is composed of lead, 3 equivalents; oxygen, 4 equivalents. The oxyd of manganese may be used as a substitute, as it gives off the oxygen very freely. A good composition for friction matches consists of phosphorus, 4 parts; niter, 10; red lead, 5. Smalt is mixed with it to impart a blue color to the tips of the matches, but it is of no use as an assistant to combustion.

J. M. J., of Md.—Dana's Mineralogy is pronounced by competent and impartial authority the best work on the subject in the world. You can procure it, we presume, by writing to John Wiley, No. 56 Walker, this city, as he keeps a general assortment of works on science

W. W., of Ga.—There are several claims advanced for the Ericsson engine, but the one in which we have most confidence is, that it requires far less skill and care to manage it than it does to manage a steam-engine. Consequently, if you require very little power, so that you cannot afford to employ an engineer, the Ericsson may possibly be well adapted to your purpose. We have not seen it sufficiently tested, however, to positively recommend it for the purpose you desire its use.

P. R., of N. Y.—In regard to the hight of your church inside to make a good room to speak in, the lower the better; but if there are no pillars, nor anything else to break the sound, there will be no difficulty in ordinary speakers making themselves heard throughout a room 40x65 feet, if you make it of any reasonable hight, especially if you arch the ceiling somewhat.

S. R. W., of N. Y.—You can make an ink which is capable of becoming visible and invisible at pleasure. It is composed of dilute chloride of cobalt, which, when written upon paper, is invisible, but when exposed to heat, so as to drive off the moisture, it becomes apparent; then, when laid aside again and cooled, moisture is absorbed and the characters disappear. Green sympathetic ink is composed of the chloride of cobalt and nickel. These inks become visible and invisible as often as they are heated and cooled on paper

H. C., of Mass.—Various mineral oil receive the name of naphtha, but the liquid which is employed for dissolving india-rubber is the rectified naphtha, either obtained from the distillation of coal tar or refining of native naphtha, which is found in petroleum springs, such as those in Kanawha, Va., and Oil creek, in Venango county, Pa.

R. P., of Pa.—The first iron boat ever constructed was a small one for a canal, in 1787, by J. Wilkenson, England. We have been informed that a small iron steamer was launched in London, in 1821, as an experiment, and that this was the first steamboat made with a metallic hull.

L. B., of Conn., asks the following question: "Can a person who can prove priority of invention of an article for which a patent has been issued, get a patent upon producing such proof; and if so, can he restrain the party holding the former patent from continuing the manufacture and sale of the article?" It is a common thing for an applicant for a patent to enter into a contest before the Patent Office with a patentee on the question of priority of invention. If the applicant for the patent should prove to the satisfaction of the Commissioner that he first made the invention a patent would be issued according to the rules of the Office established for such cases, and the fact of the issue of a second patent would be prima facie evidence of originality. The subsequent patentee could apply to the court for an injunction to restrain all parties from using his invention.

W. R., of R. I.—We have no confidence in your scheme for flying, and we advise you to stick to old mother earth, where you will be safe. Thousands of people waste valuable time and money on visionary schemes which, if they would but listen to sensible counsel, might all be saved to them. We never saw a perpetual motion man who had not had the thing a-going and would almost stake his existence on his success.

A. A., of Ga.—Your best course to pursue is to send us a sketch and description of your cotton-picker for examination. We are accustomed to giving opinions upon the probable novelty of new inventions, and make no charge for this service unless parties require of us to make an examination at the Patent Office; in such case we charge a fee of $5.

S. A., of N. Y.—Your invention may not contain a very great amount of novelty, but small changes frequently accomplish important results. Many inventors struggle to gain some particular object, and almost reach it. The last step is the important one, and whoever gains it is entitled to the honor of the invention; the other parties are entitled only to credit as experimenters. We could give you many illustrations in support of the value and importance of seemingly small improvements. Send us your model and the patent fee ($30), and We will present your claims to the Patent Office with all possible dispatch.

E. P., of Md.—The spirit-of-wine thermometer is used for low temperatures, as this liquid has never been frozen. It cannot be used for temperatures above 174°, as it boils at that temperature. All gases and vapors expand equally through the same range of temperature. 1,000 volumes of any gas, at 30°, become 1,375 volumes at 212°; expanding 1-480th for every rise in temperature of one degree of Fahrenheit.

E. G., of Ga., C. C., of Ohio, A. J., of Mo., C. R. E., of Va., H. H., of Pa.—We are very much obliged to you for the fine clubs of subscribers you have sent us for the second volume. We hope there are many friends of the SCIENTIFIC AMERICAN who will respond to our appeal to them, and do like yourselves. We are confident that the same amount of useful information cannot be obtained elsewhere.

O. C. R., of Pa.—You had better have your machine illustrated and described in our columns. The mechanical engravings which we publish weekly are unequaled, and we furnish them at a price not above what is ordinarily charged for mere botchwork. Not only this, but the circulation of the SCIENTIFIC AMERICAN exceeds the combined issues of all the other journals of its class now published in this country, and has ten times as many readers. Our paper circulates in every State in the Union.

B. A. of Mass.—We wrote you a few days ago, stating that we did not believe you could get a patent for your alleged improvement in cotton gins. You will find a letter addressed to you in the Boston Post-office. McCarty, in his patent of 1840, employs substantially the same arrangement as the one you describe. He claims the arrangement of the vibrating saws and grooved drawing roller for separating the seeds from the cotton.

C. G., of N. Y.—Dr. Thomas P. Jones died several years ago. He was at one time Superintendent of the Patent Office, and was afterwards editor of the "Franklin Journal," at Philadelphia. In his remarks on the claims of patentees published in that journal, he sometimes employed very sharp language to throw contempt upon their claims. He was engaged as a solicitor of patents, but we cannot inform you who has the care of his papers.

P. C., of N. J.—It is a poor business for any man to undertake to find out how near he can come to an inventor's claims, and still avoid an infringement of his rights. We decline to give you any advice on such a subject, as we can employ our time much better. You had better go manfully to the patentee and arrange with him to use his improvement, and no doubt he will meet you in a proper spirit. You have no claim whatever to an invention made by one of your workmen, unless you stipulated with him beforehand to make it for you. Employers blunder when they set up such preposterous claims.

F. K., of Conn.—A locomotive drawing 10 cars, and moving at the rate of 30 miles per hour, and carrying 100 lbs. pressure of steam, develops as much power as if it were drawing 20 cars, when the speed and pressure are the same. In the case of the 20 cars the momentum of the train is greater. You must not suppose that it requires as much power to draw a small train as a large one. The power of a locomotive to do work is calculated by its adhesion on the rails (which consists in the amount of weight placed on the driving-wheels) and the amount of steam acting effectively on the pistons.

G. F. B., of Texas.—To make a very durable white-wash for out-door work, take half a bushel of white lime and half a pound of common salt, and place them together in a barrel; then pour in a sufficient quantity of water to slack the lime, after which it is to be thinned with water to the consistency for putting on with a brush. A gallon of sweet milk is now to be added, and the whole stirred up, when it is ready for the whitewashing operation. The casein of the milk forms a protective coat for the lime, and prevents it being washed off by rain as soon as it otherwise would; and it does not scale off like glue that is mixed with whitewash. We do not know where you can procure an automatic fan.

Money Received

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, Dec. 10, 1859:—

F. C. L., of N. Y., $30; T. O. S., of Cal., $50; R. T., of Ohio, $30; W. J. C., of Pa., $250; F. & T., of N. Y., $30; J. M. H., of Miss., $30; J. B. T., of Ill., $30; E. S., of La., $11; J. T. R., of Pa., $10; H. L. C., of Pa., $25; E. & C., of N. Y., $29; J. A. C., of C. W., $30; J. W. P., Jr., of N. Y., $30; T. M., of N. Y., $30; J. G., of Conn., $55; W. H. McN., of N. Y., $45; R. S., of Conn., $20; G. K., of N. Y., $10; H. & V., of N. Y., $55; G. W. R. B., of La., $100; I. H., of Ind., $30; V. D., of N. Y., $45; K. V., of Mass., $150; McM. & H., of N. Y., $250; C. & S., of Mass., $25; C. A. S., of N. J., $50; C. V. L., of Texas, $25; R. A. W., of Pa., $55; J. C. R., of Vt., $30; G. E. H., of N. Y., $25; J. B., of N. Y., $30; S. S. G., of Mass., $50; J. & F. C. H., of Vt., $250; W. T., of N. Y., $25; S. C. L., of N. Y., $30; P. T., of N. J., $25; A. P. M., Jr., of Miss., $25; O. C. K., of Pa., $20; A. B., of Wis., $25; J. Y., of N. C., $30 W. C., of Iowa $25; G. C., of Ill., $30; A. G. M., of N. Y., $30; C. B., of Ohio, $30; J. B., of N. Y., $25; J. W. L., of N. Y., $30; J. S., of Ohio, $25; R. A. H., of N. Y., $30; E. A. L., of Ill., $25; S. C., of Mass., $30; J. A. C., of Conn., $20; S. & P., of Mass., $25; S. C., of Pa., $30.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Dec. 10, 1859:—

J. B. J., of N. Y.; P. T., of N. J.; W. A. G., of N. Y.; J. J. McC., of N. J.; L. & C., of Texas; A. B., of Wis.; G. E. H., of N. Y.; J. B., of N. Y.; W. T., of N. Y.; A. P. M., Jr., of Miss.; J. T. R., of Pa.; W. C., of Iowa; H. L. C., of Pa.; P. H., of Pa.; S. W., of Ga.; E. S., of La.; T. J. S., of Maine; S. & C, of Mass.; E. & C., of N. Y.; J. G., of Conn.; L. P. M., of N. Y.; S. A. C., of Ill.; E. A. L., of Ill.; G. K. P., of Mass.; J. S., of Ohio.

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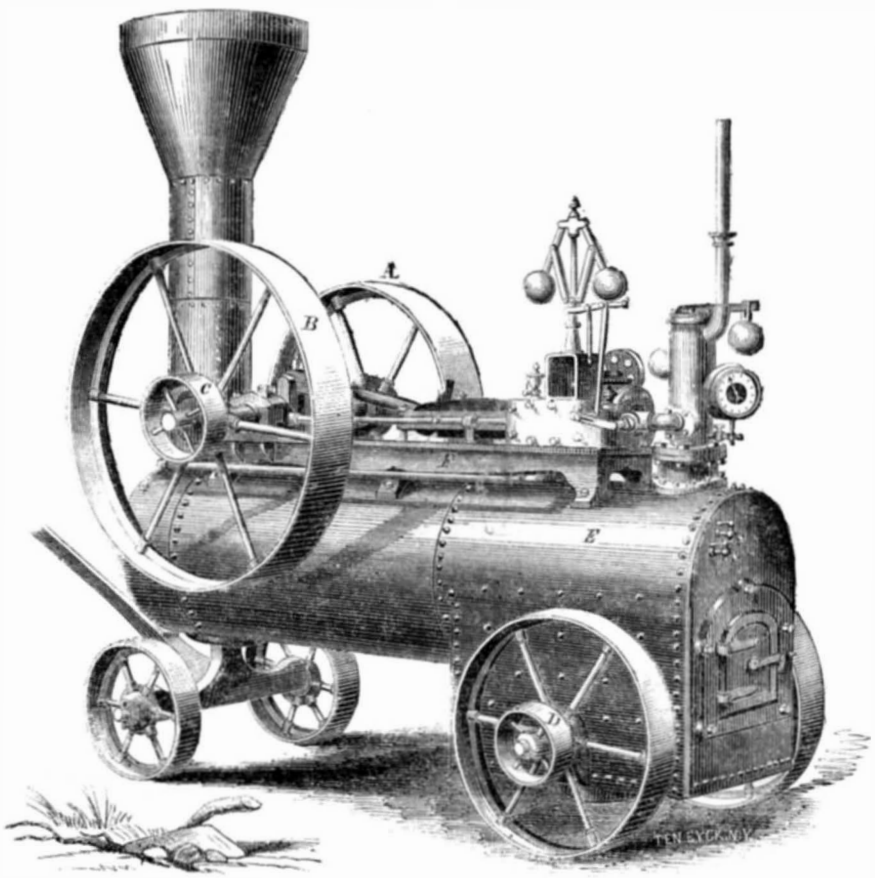
It has a locomotive boiler, E, furnished with 3-inch tubes, which are made so large to adapt them to burning pine-wood, which is generally used at the South. The bed-plate, F, is bolted upon the boiler, and sustains the cylinder and shaft. The shaft carries two driving wheels, one of which, B, is larger than the other, A, for convenience of applying the power to various machines which may require to run with different velocities. The



IMPROVED PORTABLE ENGINE.

pulley, C, on the end of the shaft is intended to be connected by a belt with the pulley, D, on the end of one axle, and thus to propel the carriage by the power of the engine.

The following are some of the advantages claimed by the manufacturers of this engine:—

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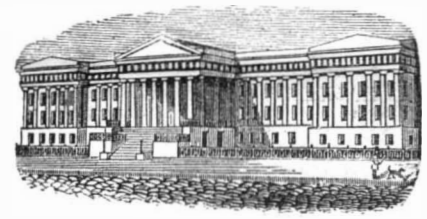
IMPORTANT TO INVENTORS.



AMERICAN AND FOREIGN PATENT SOLICITORS.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, continue to procure Patents for Inventors in the United States and all foreign countries on the most liberal terms. Our experience is of thirteen years' standing, and our facilities are unequaled by any other Agency in the world. The long experience we have had in preparing Specifications and Drawings has rendered us perfectly conversant with the mode of doing business at the United States Patent Office, and with most of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

Consultation may be had with the firm, between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH-STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Office, are cordially invited to call at our office.

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The annexed letters from the last two Commissioners of Patents we commend to the perusal of all persons interested in obtaining Patents:—

MESSRS. MUNN & CO.:—I take pleasure in stating that while I held the office of Commissioner of Patents, MORE THAN ONE-FOURTH OF ALL THE BUSINESS OF THE OFFICE came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill, and fidelity to the interests of your employers. Yours, very truly,
CHAS. MASON.

Immediately after the appointment of Mr. Holt to the office of Postmaster-General of the United States, he addressed to us the subjoined very gratifying testimonial:—

MESSRS. MUNN & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you discharged your duties as Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly deserved) the reputation of energy, marked ability, and uncompromising fidelity in performing your professional engagements. Very respectfully,
Your obedient servant, J. HOLT.

Communications and remittances should be addressed to
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